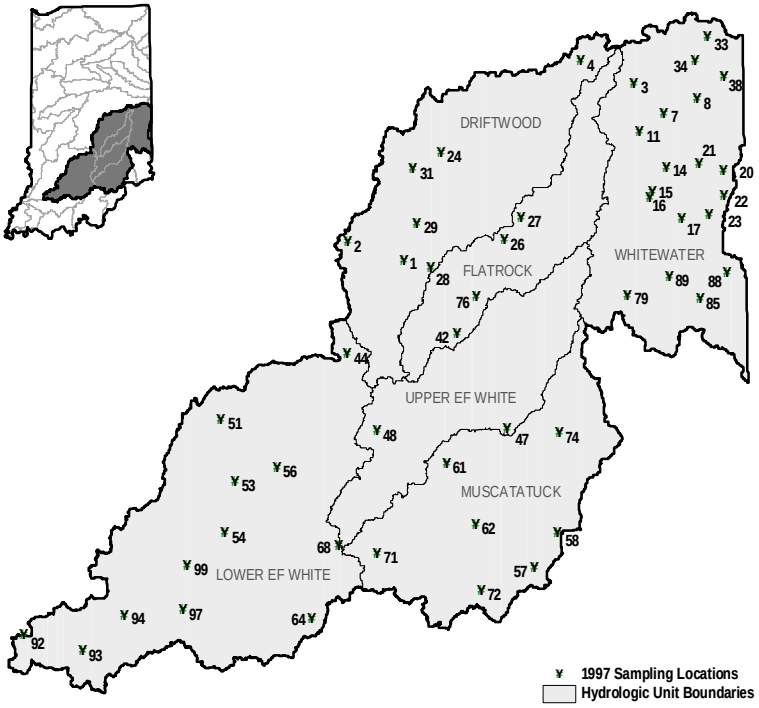
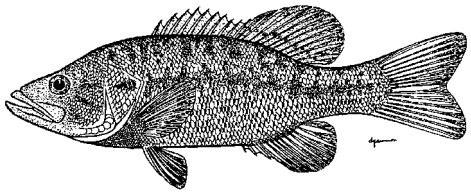
Indiana Department of Environmental Management

Office of Water Management
Assessment Branch
Biological Studies Section

Fish Community Assessment of the East Fork White River and Whitewater River Basins, Indiana, 1997





Micropterus dolomieu (Smallmouth Bass)

January 21, 2000

P.O. Box 6015, 100 North Senate Ave., Indianapolis, Indiana 46206-6015

Fish Community Assessment of the East Fork White River and Whitewater River Basins, Indiana, 1997

Ronda Dufour
Indiana Department of Environmental Management
Office of Water Management
Assessment Branch
Biological Studies Section

Fish Community Assessment of the East Fork White River and Whitewater River Basins, Indiana, 1997

Abstract

From July 1st through October 15th, 1997, the IDEM, Biological Studies Section collected fish community samples using standard pulsed-DC electrofishing equipment from 32 sites in the East Fork White River Basin and 19 sites in the Whitewater River Basin, Indiana. Sample locations were selected using the Environmental Monitoring and Assessment Program (EMAP) random grid design, developed by the USEPA. All fish captured were identified to species level, weighed, measured and released whenever possible. Small fish, difficult to identify in the field, were preserved in 10% formalin for later identification in the laboratory. Both basins were numerically dominated by cyprinid species, mainly *Semotilus atromaculatus* (creek chub), *Campostoma anomalum* (central stoneroller), *Pimephales notatus* (bluntnose minnow) and *Rhinichthys atratulus* (blacknose dace). Two state-endangered species were encountered: *Etheostoma histrio*, (harlequin darter) and *Etheostoma variatum* (varigate darter). In addition, two species of state-concern were also encountered; *Fundulus catenatus* (northern studfish) and *Moxostoma carinatum* (river redhorse). This report provides findings of the fish species collected throughout the East Fork White River and Whitewater River Basins. The Index of Biotic Integrity (IBI) was used along with the Qualitative Habitat Evaluation Index (QHEI) to aid in stream and water quality classifications within each basin. In addition, the East Fork White River and Whitewater River Basins IBI results were then compared to a preliminary state wide model which is based on historical data collected from 1990-1995 by USEPA and IDEM. Fish community data collected using the current probabalistic design examines the compositional, structural and functional integrity which is needed to evaluate the biotic condition of these two watersheds.

Table of Contents

Appendices

List of Figures

List of Tables

Acknowledgements

The collection of these data would not have been possible without the cooperation of numerous landowners who granted IDEM permission to access stream reaches located on or near their property. Not only did they grant IDEM access, many of them assisted IDEM crew members with locating easier routes along fields and through pastures. All of the field data collected and used in this report was conducted by an IDEM field crew consisting of Anthony Branam and Lisa Ritter, OWM Biological Studies Section and Steve Hall, OWM Surveys Section. The success of this project and report was a direct result of these individuals hard work and dedication. Many thanks are also extended to the following people: Steve Newhouse, OWM Biological Studies Section, for his help with the analysis and aid in the creation of the numerous graphs found throughout this report, and to Joanna Wood, OWM Surveys Section, who helped calculate total river miles for the individual river basins. IDEM would like to extend its gratitude to the USEPA Corvallis Lab, in particular Dr. Phil Larson, Dr. Tony Olsen and Barb Rosenbaum, for providing us with sampling locations, and for answering our many questions regarding the probabilistic design. The author would also like to thank Dr. Thomas P. Simon, USFWS, Bloomington, (formerly USEPA, Region 5) for all of the contributions he has made towards the development of biological criteria for the state of Indiana, and for his continued support and guidance of further developments in this area.

Guest Reviewers:

Steve Newhouse, Indiana Department of Environmental Management
Carol Newhouse, Indiana Department of Environmental Management
Stacey Sobat, Indiana Department of Environmental Management
Todd Davis, Indiana Department of Environmental Management
Anthony Branam, Indiana Department of Environmental Management
Dr. Thomas P. Simon, U.S. Fish and Wildlife Service, Bloomington

Fish Community Assessment of the East Fork White River and Whitewater River Basins, Indiana, 1997

Introduction

Over the past decade, much of the efforts used to monitor and restore surface waters of the state have been based on chemical and physical water quality and their relationship to human health risk (Karr et. al 1986). The integrity and health of ecological factors, such as fish and macroinvertebrate communities, went relatively ignored. In addition, state and federal agencies lacked the tools for easy and accurate data analysis and interpretation (Fausch et. al 1984). In the past, fish community studies tended to focus on game fish populations with little attention being given to nongame fish species. Data evaluations usually accounted for only one or two criteria, such as biomass and/or species diversity. These criteria were combined to form a single index, which tended to simplify the complexity of biological systems (Karr 1981). Clearly there was a need for state and federal agencies to develop standard methods for biological sampling and data analysis, and to incorporate these into existing and future monitoring strategies.

During the summer of 1997, IDEM's Office of Water Management, Assessment Branch began its second year of biological and water chemistry field sampling for the Surface Water Monitoring Strategy. This strategy is based on a five-year rotation scheme intended to cover all major basins in Indiana by the year 2000 (IDEM 1996) . Site selections, based on the Environmental Monitoring and Assessment Program (EMAP), were chosen and provided to the IDEM by the USEPA Environmental Research Laboratory, Corvallis, Oregon (Overton and others 1991; USEPA 1994). This sampling approach selects sites randomly from within an ecoregion or watershed, provides unbiased estimates of status and trends, and offers broad geographic coverage. In addition, it is able to account for ecological factors such as habitat and biological condition as well as pollutant monitoring (USEPA 1994).

By focusing staff efforts on chemical and ecological sampling of smaller areas of coverage (ie. watersheds), a holistic approach is taken when defining the water quality of the watershed. This sampling approach, termed probabilistic, offers scientists and managers a basic overview of the water quality status and ecological health condition of the watershed in study. Fish community data, collected using this probabilistic approach, may then be compared to historic fish communty data to monitor status and trends and make comparisons to neighboring watersheds. The purpose of this paper is to evaluate the status and health of the fish community of the East Fork White River and Whitewater River Basins, and to assess the overall water quality within each watershed based on the results.

Methods

Basin Description

Fish community surveys were conducted at 33 sampling locations within the East Fork White River Basin, and at 19 locations within the Whitewater River Basin. Small tributaries as well as larger mainstem sampling locations were included. All areas of the stream were sampled when possible (riffle, run, and pool sequences) and both stream banks were included on all streams. Approximately 10% of the sites (6 previously-sampled locations) were re-sampled to account for field technique and seasonal variability. Water chemistry, macroinvertebrates, fish tissue, sediment and habitat evaluations were conducted within the watersheds, in addition to fish community data.

The East Fork White River drains approximately 4,330 square miles of southeastern Indiana (Joanna Wood, personal communication). Major tributaries include Indian Creek, Sand Creek, Salt Creek, Muskatatuck River, White Creek, and Lost River. The East Fork White River is formed by the convergence of the Flatrock River, Driftwood River, Sugar Creek, and Big Blue River. It spans three ecoregions, the Eastern Corn Belt Plains, the Interior Plateau, and the Interior River Lowland. The East Fork joins the White River mainstem near Petersburg, Indiana, where it flows for approximately 50 miles before joining the Wabash River in Gibson County. Land use is primarily agricultural in the northern part of the basin, and of varied land use, such as forestry, livestock and oil and gas production, in the southern portion (Simon 1992).

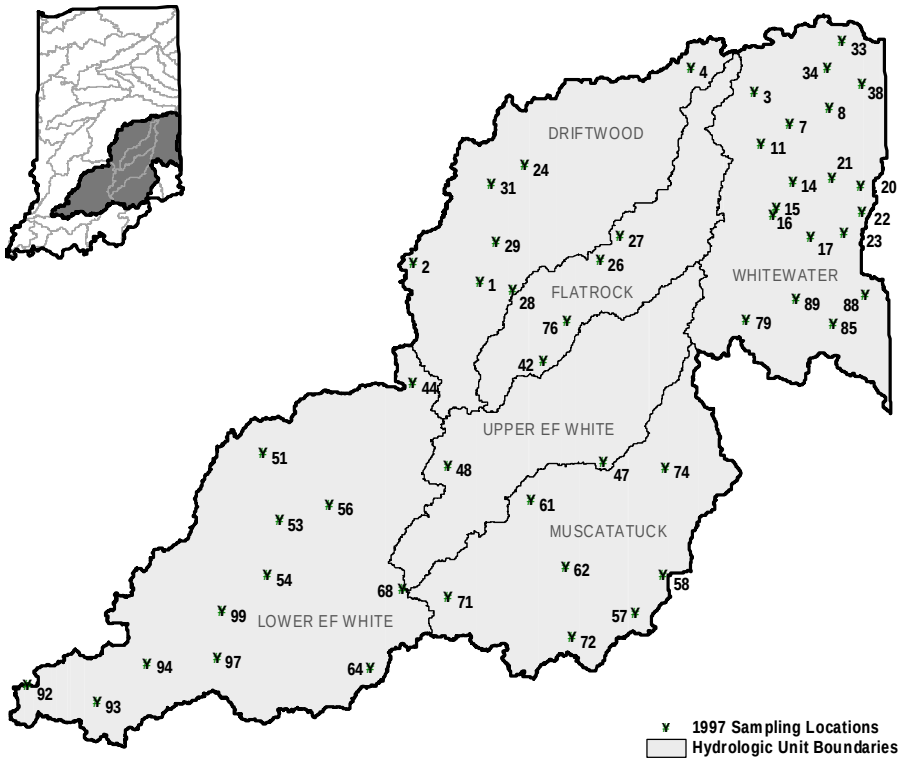


Figure 1 Fish community sampling locations in the East Fork White River and Whitewater River Basins, 1997

Historical fisheries data for the White River Basin have been compiled and well documented by the U.S. Geological Survey in a report entitled "Fishes of the White River Basin, Indiana" by Crawford, Lydy and Frey (1996). In addition, several fish management reports have been produced by the Fisheries Section of the Indiana Department of Natural Resources (IDNR), Division of Fish and Wildlife: Andrews (1993); Carnahan (1996); Kiley and Keller (1993); Lehman (1994, 1995a, 1995b, 1995c, 1995d, 1995e, 1995f); and Mavrakis (1995).

The Whitewater River drains approximately 1,369 square miles of Indiana and Ohio (Joanna Wood, personal communication). The river begins in Randolph County, Indiana and flows south, then southeast, where it crosses the state line and enters Ohio. The river flows for about 8 miles in Ohio before it joins the Great Miami River, which eventually drains into the Ohio River. Major tributaries include: the East Fork Whitewater River, Salt Creek, Nolands Fork, Martindale Creek, Pipe Creek, and Greens Fork. The predominant land use is agriculture, including rowcrops of corn, beans and wheat. Some of the land is being used as pasture for livestock. This basin has a rugged hilly terrain with rock outcrops and much of the area remains forested (McFall 1999).

Several recent fish management reports have been produced by the Fisheries Section of the IDNR, Division of Fish and Wildlife, on rivers and streams within the Whitewater River Basin: Keller (1997); Wisener (1997); Kingsley and Kiley (1989); Dorsett (1995); and Walterhouse (1993). In addition, a survey was conducted within the basin by Seegert (1990) on the status of the variegate darter (*Etheostoma variatum*).

Sampling Technique

Samples were collected using standard pulsed-DC electrofishing methods as outlined in the Biological Studies Section's, Standard Operating Procedures for electrofishing equipment and safety (IDEM 1992) for headwater, wadeable, and boatable streams (OHEPA 1987a, 1987b, 1987c). The type of gear used at each site depended on stream size, morphology, and access to the sampling location. A Model 15-D Smith-Root generator-backpack electrofishing unit was generally used to sample headwater streams and wadeable streams with an average width of 7 meters or less. A Smith-Root pulsed-DC totebarge, capable of 300 volt output and 8-10 amps, was used to sample larger streams when the access allowed. A 16 foot jon boat with a Coffelt 2.5 vvp-2E, capable of 360-540 volt output and 6-8 amps powered by a 5000 watt generator, was used to sample large riers.

A Coleman scanoe configured with the same electrofishing equipment as the totebarge system was used to sample sites that were to deep to wade, and too shallow for a boat. This system allowed the field crew to float through areas of a stream reach that would have gone unsampled using the totebarge method alone. Since it is impossible to collect all species within a specified reach without repeated sampling efforts, an attempt was made to collect a representative sample from within the reach to reflect diversity, distribution, and abundance of the resident fish community. Sampling reach was determined by a calculation of 15 times the wetted stream width, with a minimum of 50 meters for small headwater streams and a maximum of 500 meters on large rivers.

During the sampling event, fish were collected using standard electrofishing gear, then placed in a live-well until field processing could occur. Water within the live-well was replaced often, especially during warmer weather to minimize mortality. Fish were sorted by family or genus groups into buckets with flow-through holes. Fish were identified to species level, then counted, weighed to the nearest gram (g) as individuals or in groups called batches, measured to the nearest millimeter (mm) as total length (TL), examined for external anomalies, and then returned to the stream. Due to gear limitations and the difficulty of proper identification of small fish, all fishes under 20 mm TL were not included in the sample.

Taxonomic voucher specimens consisting of one or two fish of each species were preserved in the field using 10% formalin. Photographs were taken in place of a voucher specimen for fish that were too large to be adequately preserved in the field. Fish not easily recognizable in the field, such as small minnows, darters, and young of the year (YOY) over 20 mm, were preserved for later identification in the laboratory.

These fish were identified using keys found in Gerking (1945), Trautman (1981), Becker (1983), Pflieger (1975), Etnier and Starnes (1993), and Kuehne and Barbour (1983). All voucher specimens are verified by Dr. Thomas P. Simon, USFW, Bloomington and will be housed at the Indiana State Museum in Indianapolis, Indiana. The photographs of voucher specimens will remain at IDEM's Shadeland Office in Indianapolis Indiana.

In addition to collecting fish samples, flow measurments and basic water chemistry such as dissolved oxygen (D.O.), pH, specific conductivity and water temperature (°C) was determined using a Hydrolab Scout (Hall and Christensen 1998). An assessment of the physical habitat was made using the Qualitative Habitat Evaluation Index (QHEI) (Rankin 1989). A Trimble Geo Explorer (Global Positioning System) was used to confirm site location. Water chemistry samples were collected at all locations and fish tissue (creek chub, *Semotilus atromaculatus*) and sediment samples were taken whenever adequate amounts were found within the stream reach (Stahl 1997).

Data Analysis

After all fish community samples were processed in the laboratory raw data were reduced for data entry, checked for accuracy, and entered into an electronic database. The data were then checked for any data entry errors and corrections were made if necessary. Site specific IBI and QHEI scores as well as basic water chemistry results can be found in Appendix C. Detailed descriptions of metric selection and calibration can be found in Karr (1981, 1986), Ohio EPA (1987a, 1987b, 1987c) and Simon (1991, 1992, 1998).

Statistical analysis and graphics were prepared using Statistica 5.1. Correlations of habitat quality and total IBI scores were made according to Sokal and Rohlf (1973). Historic fish community data collected between 1990 and 1995 were compiled into a state wide model based on IBI scores for all sites. The data were then plotted for each watershed and compared to the preliminary statewide model to evaluate how each basin compared to the rest of the state. In addition, predicted percentages for non-

supporting miles were done using nonparametric statistics. Total river miles were slighty modified from their original form in the USEPA river reach version 3 file and provided to the Biological Studies Section by Joanna Wood, IDEM, Geographic Information Systems coordinator. Sample locations were plotted using Arc View GIS.

Results

East Fork White River Basin

Fourty-nine sampling locations were selected randomly for the East Fork White River Basin. Of the original 49 sites, 15 were not sampled due to: dry stream channel, denied access request from landowner, or the access route was found to be to difficult or dangerous. From the remaining 34 locations we were able to collect fish community samples from 32 of the sites (Figure 1). We were unble to collect a fish community sample at two of the 34 sites due to equipment failure (Salt Creek, event ID 97052.0) and one site was eliminated due to a recent fish kill (Tributary of White Creek, event ID 97049.0) (Appendix A). To document sampling variability, 3 of the 32 sampled sites were re-sampled later in the season. All stream sizes were included in the study and were catagorized as follows: 19 headwater (drainage area less than or equal to 20 square miles), 9 wadeable (drainage area greater than 20 to less than or equal to 1000 square miles) and 4 large river (drainage area greater than 1000 to less than or equal to 2000 square miles) (Simon 1991, 1992).

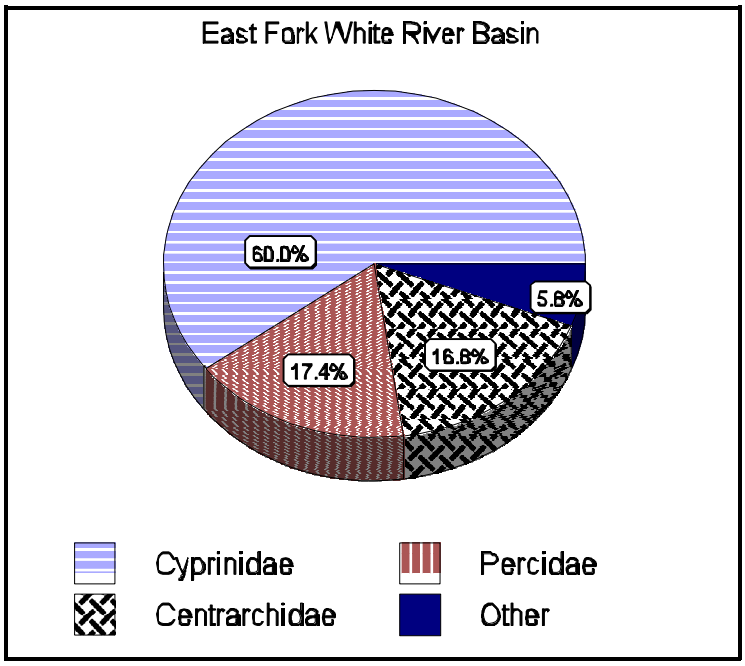


Figure 2 Distribution of fish by family level throughout the East Fork White River Basin, Indiana, 1997

Table 1. List of Species from the East Fork White River Basin, 1997

Petromyzontidae (lampreys)
- Ichthyomyzon castaneus, chestnut lamprey
- Petromizontidae sp. Ammocoetes

Lepisosteidae (gars)
- Lepisosteus osseus longnose gar
- Lepisosteus platostomus shortnose gar

Amiidae (bowfin)
- Amia calva bowfin

Clupeidae (herring and shad)
- Dorosoma cepedianum gizzard shad
- Alosa chrysochloris skipjack herring

Esocidae (pike)
- Esox americanus grass pickerel

Umbridae (mudminnow)
- Umbra limi central mudminnow

Cyprinidae (carps and minnows)
- Cyprinus carpio carp
- Hybognathus nuchalis Mississippi silvery minnow
- Hybognathus hayi cypress minnow
- Notemigonus crysoleucus golden shiner
- Semotilus atromaculatus creek chub
- Rhinichthys atratulus blacknose dace
- Nocomis micropogon river chub
- Notropis rubellus rosyface shiner
- Notropis atherinoides emerald shiner
- Notropis ludibundus sand shiner
- Notropis volucellus mimic shiner
- Notropis wickliffi channel shiner
- Notropis boops bigeye shiner
- Notropis buccatus silverjaw minnow
- Hybopsis amblops bigeye chub
- Phenacobius mirabilis suckermouth minnow
- Campostoma anomalum central stoneroller
- Pimephales notatus bluntnose minnow

Cyprinidae cont.
- Pimephales promelas fathead minnow
- Pimephales vigilax bullhead minnow
- Phoxinus eythrogaster southern redbelly dace
- Cyprinella spiloptera spotfin shiner
- Cyprinella whipplei steelcolor shiner
- Luxilus chrysocephalus striped shiner
- Lythrurus ardens rosefin shiner
- Lythrurus fumeus ribbon shiner
- Lythrurus umbratilis redfin shiner
- Opsopoeodus emiliae pugnose minnow

Catostomidae (suckers and buffalo)
- Catostomus commersoni white sucker
- Carpiodes cyprinus quillback
- Carpiodes carpio river carpsucker
- Erimyzon oblongus creek chubsucker
- Moxostoma macrolepidotum shorthead redhorse
- Moxostoma duquesnei black redhorse
- Moxostoma erythrurum golden redhorse
- Hypentilium nigricans northern hogsucker
- Ictiobus bubalus smallmouth buffalo
- Ictiobus cyprinellus bigmouth buffalo
- Minytrema melanops spotted sucker

Ictaluridae (bullhead and catfish)
- Ictalurus punctatus channel catfish
- Noturus miurus brindled madtom
- Pylodictus olivaris flathead catfish
- Ameiurus melas black bullhead
- Ameiurus natalis yellow bullhead

Apherododeridae (pirate perch)
- Aphredoderus sayanus pirate perch

Fundulidae (topminnows)
- Fundulus catenatus northern studfish
- Fundulus notatus blackstripe topminnow

Cottidae (sculpin)
- Cottus bairdi mottled sculpin

Centrarchidae (black bass and sumfish)
- Ambloplites rupestris rock bass
- Centrarchus macropterus flier
- Lepomis cyanellus green sunfish
- Lepomis gulosus warmouth
- Lepomis macrochirus bluegill
- Lepomis megalotis longear sunfish
- Lepomis microlophus redear sunfish
- Micropterus dolomieu smallmouth bass
- Micropterus salmoides largemouth bass
- Micropterus punctulatus spotted bass
- Pomoxis annularis white crappie
- Pomoxis nigromaculatus black crappie

Percidae (perch and darters)
- Etheostoma gracile slough darter
- Etheostoma spectabile orangethroat darter
- Etheostoma nigrum Johnny darter
- Etheostoma asprigene mud darter
- Etheostoma blennioides greenside darter
- Etheostoma caeruleum rainbow darter
- Etheostoma flabellare fantail darter
- Etheostoma histrio harlequin darter
- Etheostoma microperca least darter
- Percina caprodes logperch
- Percina sciera dusky darter
- Percina maculata blackside darter
- Percina phoxocephala slenderhead darter
- Stizostedion canadense sauger

Sciaenidae (drum)
- Aplodinotus grunniens freshwater drum

There were a total of 8,173 fish captured in the East Fork White River Basin representing 15 families and 84 species (Table 1). Cyprinidae (carps and minnows) numerically dominated the basin (60.0%), with 38.3% of the total number of individuals contained within just three species, *Pimephales notatus* (bluntnose minnow), *Campostoma anomalum* (central stoneroller), and *Semotilus atromaculatus* (creek chub). The Cyprinidae were followed by Percidae (perch and darters) at 17.4% and Centrarchidae (black bass and sunfish) at 16.8% (Figure 2). Fish species considered to be rare, endangered or of concern encountered in the East Fork White River Basin were: *Hybopsis amblops* (bigeye chub),which is rare in Indiana; *Opsopoeodus emiliae* (pugnose minnow) also rare; *Fundulus catenatus* (northern studfish) of state-concern; *Moxostoma carinatum* (river redhorse) also state-concern; *and Etheostoma histrio* (harlequin darter) state-endangered.

Biological condition was determined using the Index of Biotic Integrity metrics (IBI), which have been calibrated for the Eastern Cornbelt Plains Ecoregion (Simon 1998). Overall water quality of the East Fork White River Basin based on total IBI scores ranged from a low of 12, very poor (Big Blue River, 97004) to a high of 54, excellent (Sugar Creek, 97001). Habitat ratings based on QHEI scores in the East Fork White River Basin ranged from a low of 39 (Youngs Creek, 97002) to a high of 83 (Clear Creek, 97051). Habitat and IBI scores were then compared using methods of Sokal and Rohlf (1973) and a direct correlation was found to exist between habitat quality and IBI score (Figure 3).

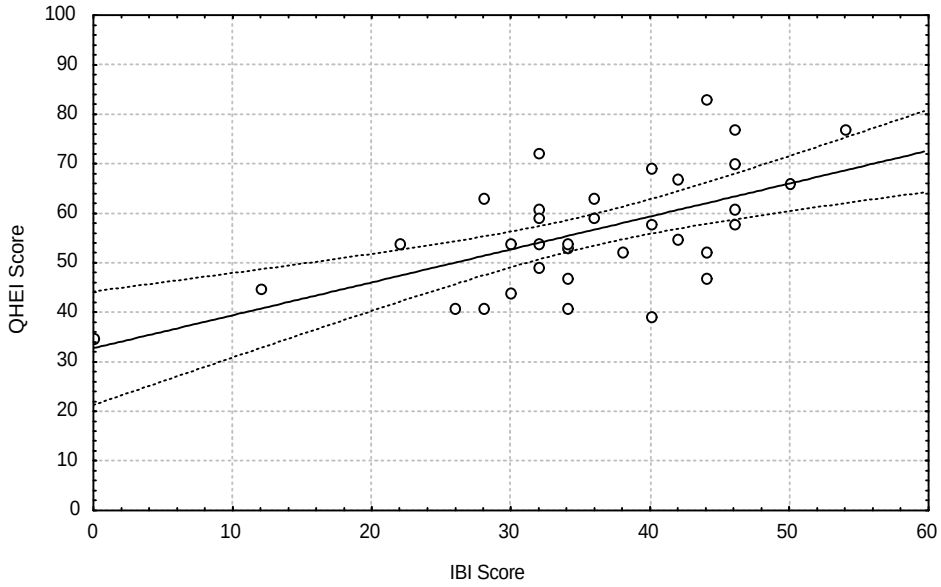


Figure 3 Correlation between QHEI and IBI for the East Fork White River Basin 1997

Historical fish community data collected between 1990 and 1995 by USEPA and IDEM, were compiled into a state wide model based on total IBI scores, and were then plotted using a boxplot and whisker for all sites, across all ecoregions (Figure 4). The mean IBI score for all sites (n=831) was found to be 35.27. IBI scores range from a low of 0 to a high of 58, with a standard deviation of 10.37 points. The probabalistic data for the East Fork White River and Whitewater River Basins were plotted and compared to the state model. This allowed for an overall comparative picture of how each basin's biological condition compared to the rest of the state (Figure 5).

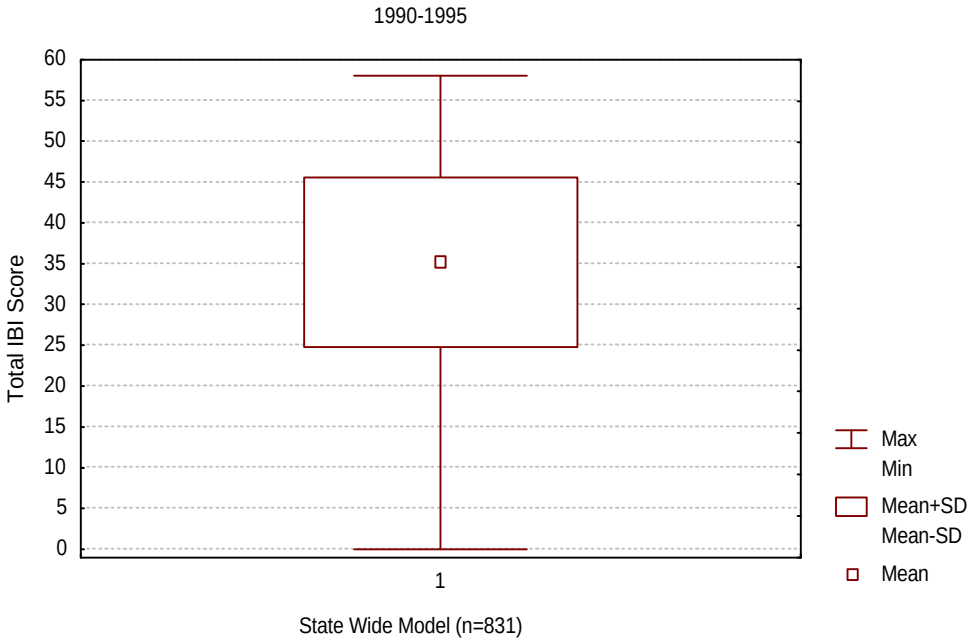


Figure 4 Preliminary state wide model based on historical fish community sampling collected across all ecoregions (Omernick and Gallant 1988)

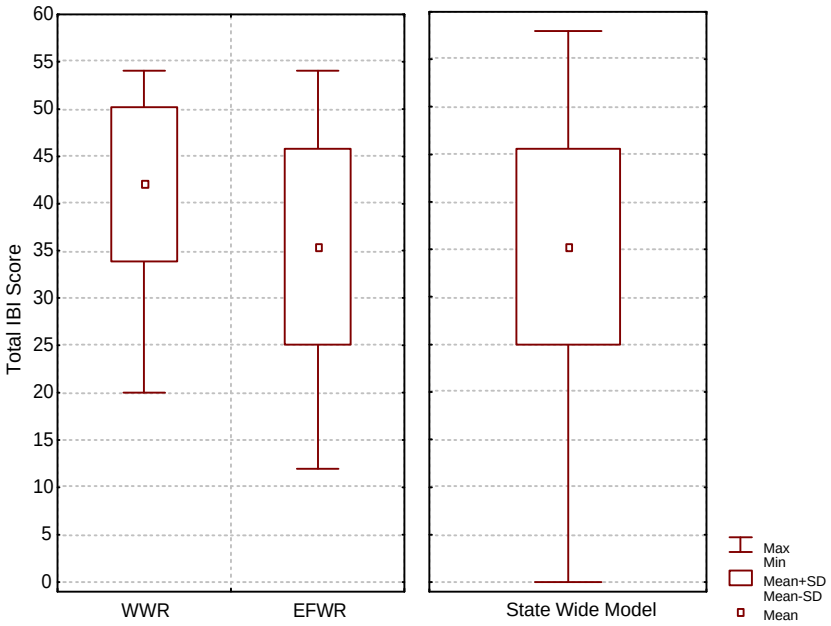


Figure 5 Comparison of the East Fork White River and Whitewater River Basins to the state wide model

The mean IBI score for the East Fork White River (n=32) was calculated as 36.69, with the remaining data being equally distributed above and below. To calculate the number of miles considered to be non supporting for the basin studies we subtracted ½ SD (5.18) from the state wide mean (35.27), to get 30.09. Therefore any score less than or equal to an IBI score of 30 was considered to be non supporting. We chose to use ½ of the SD because it represents a difference of at least 5 IBI points (and consists of data gathered from both "good" and "bad" stream reaches). Rankin and Yoder (1990) state "because we used a mix of impacted and relatively unimpacted sites deviations of greater than 4 units probably reflects variation of anthropogenic origin." The results of the East Fork data showed that approximately 30% of the river miles within the basin are expected to be non supporting (Figure 6).

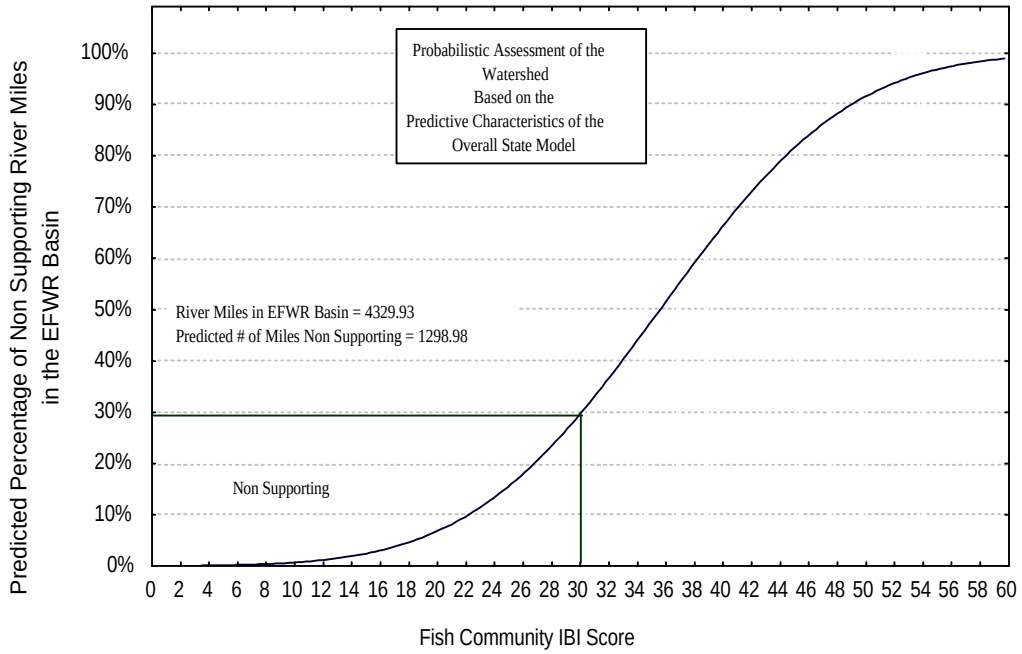


Figure 6 Number of River miles non supporting in the East Fork White River Basin based on probabalistic sampling 1997

Whitewater River Basin

Thirty-one sampling locations were chosen for sampling within the Whitewater River Basin. Twelve of 31 sites were not sampled due to dry stream beds, denied access from landowner, or difficulty of stream access (see Figure 1). Therefore, a total of 19 sites were sampled for fish community in the Whitewater River Basin during the 1997 field season (Appendix B). Of the 19 sites sampled, 2 were selected to serve as "duplicate" sites. Stream size catogorizations within the Whitewater River Basin were: 8 headwater (drainage area less than or equal to 20 square miles), 10 wadeable (drainage area greater than 20 and less than or equal to 1000 square miles), and 1 large river (drainage area greater than 1000 square miles).

There were a total of 6,827 fish collected in the Whitewater River Basin representing 9 families and 53 species (Table 2) . Cyprinidae (carps and minnows) were the numerically dominant family at 70.7%, with 45.3% of the total number of individuals comprised of three Cyprinidae species, *Rhinichthys atratulus* (blacknose dace), *Campostoma anomalum* (central stoneroller), and *Semotilus atromaculatus* (creek chub). The Cyprinidae were followed by Percidae (perch and darters) with 9.0%, then Cottidae (sculpins) at 7.3% (Figure 7). One state-endangered species, *Etheostoma variatum* (varigate darter) was encountered in the Whitewater River Basin.

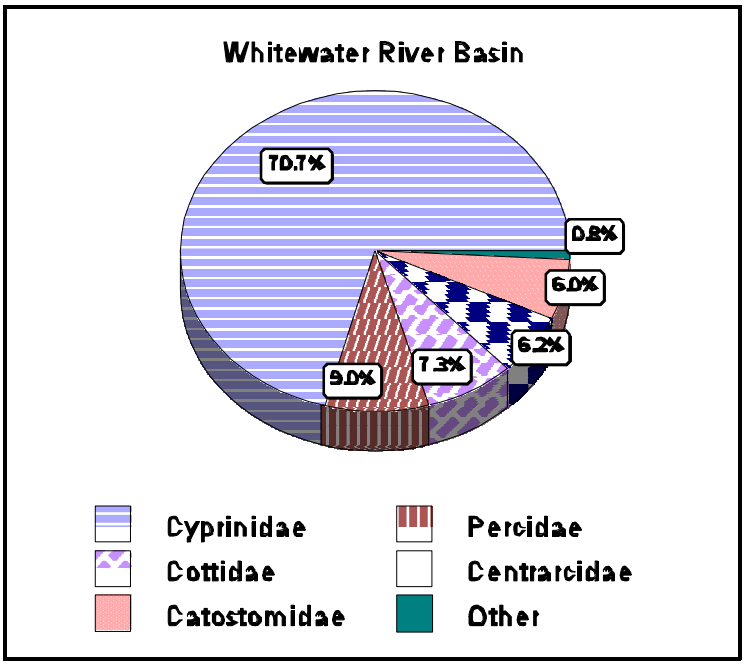


Figure 7 Distribution of fish by Family level throughout the Whitewater River Basin, Indiana, 1997

Biological condition was determined using the IBI metrics developed for the Eastern Corn Belt Plain Ecoregion (Simon 1998). The IBI scores from the Whitewater River basin ranged from a low of 20, very poor (Trib of Harold Creek, 97022) to a high of 54, excellent (Nolands Fork, 97008; East Fork Whitewater River, 97021). Habitat scores within the Whitewater River Basin ranged from a low of 53 (East Fork Big Cedar Creek, 97088) to a high of 83 (Greens Fork, 97034). When habitat scores were plotted against IBI scores a direct correlation was found to exist between habitat quality and IBI score (Figure 8) (Sokal and Rohlf 1973).

The mean IBI score for the Whitewater River basin (n=19) was 41.90, which is approximately one half SD above the statewide mean of 35.27. While the East Fork IBI scores tend to mimic the state wide model, the Whitewater IBI scores on the other hand show a shift towards the upper end. When both basins were plotted next to the state model it became apparent that the lower end of the boxplot for the Whitewater basin were just slightly below the mean or average scores for the East Fork Basin and the model (see Figure 4). Based on these findings the Whitewater River Basin appears to show a higher biological integrity then the East Fork White River, as well as the state model. Non supporting status

Table 2. List of Species from theWhitewater River Basin, 1997

Petromyzontidae (lampreys)

Lamprey sp.	ammocoetes

Clupeidae (herring and shad)

Dorosoma cepedianum	gizzard shad

Cyprinidae (carps and minnows)

Cyprinus carpio	carp
Carassius auratus	goldfish
Semotilus atromaculatus	creek chub
Rhinichthys atratulus	blacknose dace
Nocomis micropogon	river chub
Notropis rubellus	rosyface shiner
Notropis atherinoides	emerald shiner
Notropis ludibundus	sand shiner
Notropis volucellus	mimic shiner
Notropis photogenis	silver shiner
Euricymba buccata	silverjaw minnow
Phenacobius mirabilis	suckermouth minnow
Campostoma anomalum	central stoneroller
Pimephales notatus	bluntnose minnow
Pimephales promelas	fathead minnow
Pimephales vigilax	bullhead minnow
Phoxinus eythrogaster	southern redbelly dace
Cyprinella spiloptera	spotfin shiner
Luxilus chrysocephalus	striped shiner
Lythrurus ardens	rosefin shiner
Lythrurus umbratilis	redfin shiner

Catostomidae (suckers and buffalo)

Catostomus commersoni	white sucker
Carpiodes cyprinus	quillback
Carpiodes velifer	highfin carpsucker
Moxostoma macrolepidotum	shorthead redhorse
Moxostoma duquesnei	black redhorse
Moxostoma erythrurum	golden redhorse
Hypentilium nigricans	northern hogsucker

Ictaluridae (bullhead and catfish)

Ictalurus punctatus	channel catfish
Noturus flavus	stonecat
Ameiurus melas	black bullhead
Ameiurus natalis	yellow bullhead

Cottidae (sculpin)

Cottus bairdi	mottled sculpin

Centrarchidae (black bass and sunfish)

Ambloplites rupestris	rock bass
Lepomis cyanellus	green sunfish
Lepomis macrochirus	bluegill
Lepomis megalotis	longear sunfish
Micropterus dolomieu	smallmouth bass
Micropterus salmoides	largemouth bass
Micropterus punctulatus	spotted bass
Pomoxis annularis	white crappie

Percidae (perch and darters)

Etheostoma spectabile	orangethroat darter
Etheostoma nigrum	Johnny darter
Etheostoma blennioides	greenside darter
Etheostoma caeruleum	rainbow darter
Etheostoma flabellare	fantail darter
Etheostoma variatum	variegate darter
Etheostoma zonale	banded darter
Percina caprodes	logperch
Percina phoxocephala	slenderhead darter

Sciaenidae (drum)

Aplodinotus grunniens	freshwater drum

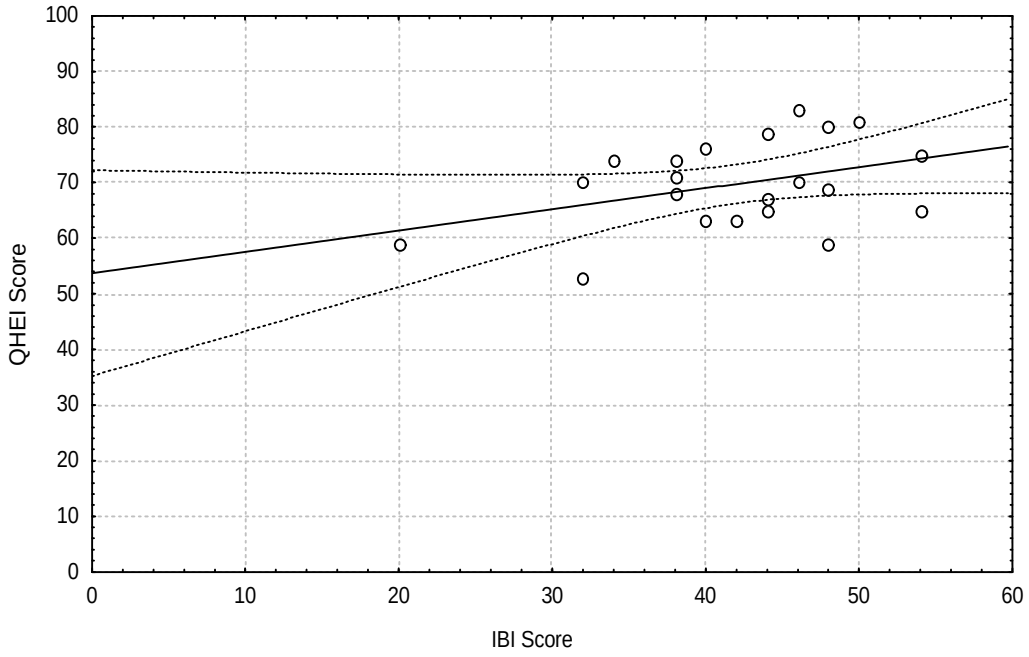


Figure 8 Correlation between QHEI and IBI for the Whitewater River Basin 1997

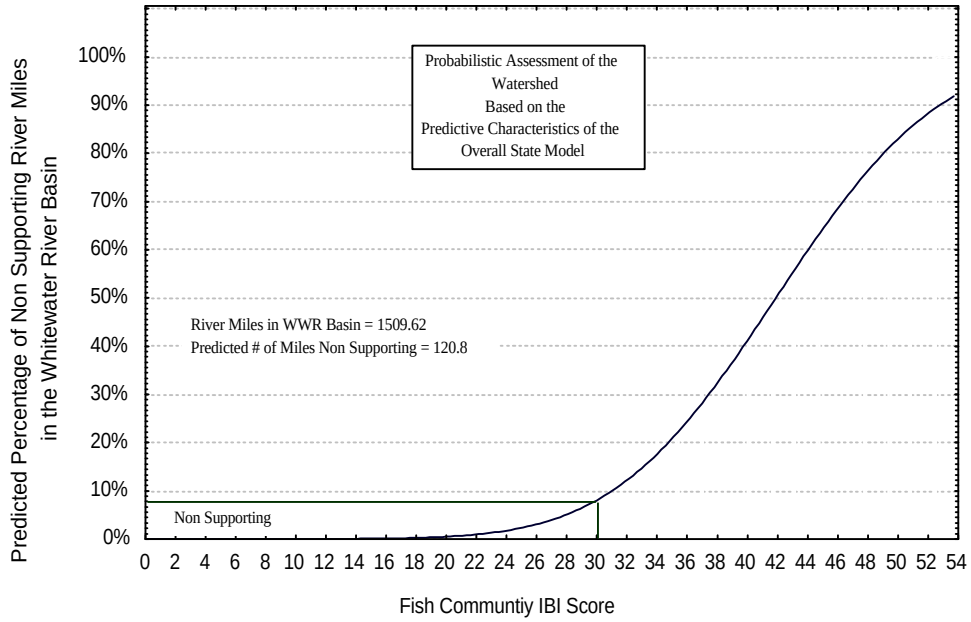


Figure 9 Number of River miles non supporting in the Whitewater River Basin based on probabalistic sampling 1997

was determined using the same standards applied to the East Fork White and described on pages 6 and 8. The results of the Whitewater data showed that < 10% of the river miles within the basin were considered to be non supporting (Figure 9). Again, indicating that the Whitewater Basin as a whole supports a well balanced fish community.

Conclusion

This study allowed us to evaluate overall water quality status based on the structure, function and composition of resident fish communities. When we compared the state wide model to the individual basins, we found that the East Fork White River appears to be a mirror image of the state model. The mean IBI score for the East Fork White River Basin was 36.69, just slightly above the state mean of 35.27. The Whitewater River Basin on the other hand, had a mean IBI score of 41.9, which is 6.63 IBI points higher than the state mean (35.27). Differences in IBI scores of more than 4 IBI points are considered to be significant, which indicates that the Whitewater River Basin is supporting well balanced and healthy fish communities. Approximately 30% of the East Fork White River Basin (1298.98 miles) are listed as non supporting, where as the Whitewater river had less than 10% of its river miles (120.77 miles) considered to be non supportive. In addition, this study also showed us that habitat availability and quality have a direct impact on the resident biological communities. This trend was evident in both basins.

The probability design permited us to sample a variety of stream types and sizes in an unbiased, non-intensive manner. This sampling approach provides us with a “big picture” of the current water quality condition, within a watershed. By focusing all of the sampling efforts into a relatively small study area (ie. major watersheds) we were able to collect multiple parameters such as physical, chemical and biological data. By comparing physical (habitat), chemical (D.O., pH, temperature and water column chemistry data) and biological (fish communities) environmental managers are able to make better decisions, based on a holistic approach, not just a single parameter or score. Managers therefore can determine where further studies are needed, as well as, which areas may need better protection, and/or enhancement. By using the probability data along with the agencies historical data and analytical tools such as the IBI, we will be able to continue to detect differences in water quality condition by using resident fish communities as indicators.

References Cited

Andrews SJ. 1993. Fisheries survey of the Middle East Fork of White River. Indiana Department of Natural Resources, 1992. Indianapolis. 28 p.

Becker GC. 1983. Fishes of Wisconsin. University of Wisconsin Press: Madison, WI. 1052 p.

Carnahan DP. 1996. Fisheries survey of the Big Blue River watershed, including Big Blue River, Little Blue River, and Brandywine Creek in Hancock, Henry, Johnson, Rush, and Shelby Counties, 1995. Indiana Department of Natural Resources. Indianapolis. 95 p.

Crawford CG, M.J Lydy, and JW Frey. 1996. Fishes of the White River Basin, Indiana. U.S. Geological Survey (USGS). Water-Resources Investigations Report 96-4232.

Dorsett MJ. 1995. Fisheries survey of the East Fork of Whitewater River, 1994. Indiana Department of Natural Resources. Indianapolis. 36 p.

Etnier DA., WC Starnes. 1993. The Fishes of Tennessee. University of Tennessee Press: Knoxville, TN. 681 p.

Faush KD, JR Karr, PR Yant. 1984. Regional application of an Index of Biotic Integrity based on stream fish communitites. Trans. Am. Fish Soc. 113: 39-55.

Gerking SD. 1945. Key to the fishes of Indiana. Inv. Ind. Lakes and Streams 4:49-86.

Hall SD, CC Christensen. 1998. 1997 Probabalistic Monitoring Program Assessment of the East Fork White River and the Whitewater River Basins. Indiana Department of Environmental Management, Office of Water Management, Assessment Branch, Surveys Section. Indianapolis IN. IDEM 32/02/012/1998.

Indiana Department of Environmental Management (IDEM). 1992. Standard Operating Procedures for electrofishing. IDEM. Indianapolis, IN. 231 p.

Indiana Department of Environmental Management (IDEM). 1996. Office of Water Management: Surface Water Monitoring Strategy, 1996-2001. IDEM. Indianapolis, IN.

Karr JR. 1981. Assessment of biotic integrity using fish communities. Fisheries 6:21-7.

Karr JR, KD Fausch, PL Angermeier, PR Yant, and IJ Schlosser. 1986. Assessing biological integrity in running waters: a method and its rationale. Illinois Special Publication 5.

Keller DC. 1997. Fisheries survery of Salt Creek, 1997. Indiana Department of Natural Resources. Indianapolis. 30 p.

Kiley AL, DC Keller. 1993. Fisheries survey of eastern Indiana Sugar Creek and tributaries, 1991.

Indiana Department of Natural Resources. Indianapolis. 79 p.

Kingsley DW, AL Kiley. 1989. Fisheries survey of the West Fork of Whitewater River and tributaries, 1983 and 1986. Indiana Department of Natural Resources. Indianapolis. 97 p.

Kuehne RA, RW Barbour. 1983. The American Darters. University Press of Kentucky: Lexington, KY. 177p.

Lehman LL. 1994. Fisheries survey of East Fork White River in Bartholomew and Jackson Counties, 1993. Indiana Department of Natural Resources. Indianapolis. 42 p.

Lehman LL. 1995a. Fisheries survey of Vernon Fork Muscatatuck River, 1992-1993. Indiana Department of Natural Resources. Indianapolis. 72 p.

Lehman LL. 1995b. Fish and habitat survey of Sugar Creek at Atterbury State Fish and Wildlife Area and the Driftwood River at Driftwood State Fishing Area, 1993. Indiana Department of Natural Resources. Indianapolis. 26 p.

Lehman LL. 1995c. Fisheries survey of Muscatatuck River, 1994. Indiana Department of Natural Resources. Indianapolis. 33 p.

Lehman LL. 1995d. Fisheries survey of Graham Creek, 1994. Indiana Department of Natural Resources. Indianapolis. 29 p.

Lehman LL. 1995e. Fisheries survey of Big Creek, 1994. Indiana Department of Natural Resources. Indianapolis. 27 p.

Lehman LL. 1995f. Fisheries survey of Sand Creek, 1994.Indiana Department of Natural Resources. Indianapolis. 30 p.

Mavrakis PH. 1995. Fisheries survey of the Flatrock River, 1995. Indiana Department of Natural Resources. Indianapolis. 90 p.

McFall LJ. 1999. Geography, Geology, Hydrology and Suspended Solids loadings of the Whitewater River Basin. Indiana Department of Environmental Management, Office of Water Management, Assessment Branch, Biological Studies Section, Indianapolis, IN. IDEM 32/02/010/1998.

Ohio Environmental Protection Agency (OHEPA). 1987a. Biological Criteria for the Protection of Aquatic Life. Volume I. The role of Biological Data in Water Quality Assessment.Ohio Environmental Protection Agency, Columbus, OH.

Ohio Environmental Protection Agency (OHEPA). 1987b. Biological Criteria for the Protection of Aquatic Life. Volume II. Users Manual for Biological field assessment of Ohio surface waters. Ohio Environmental Protection Agency, Columbus, OH.

Ohio Environmental Protection Agency (OHEPA). 1987c. Biological Criteria for the Protection of

Aquatic Life. Volume III. Standardized Biological field sampling and laboratory methods for assessing fish and macroinvertebrate communities. Ohio Environmental Protection Agency, Columbus, OH.

Overton WS, DL Stevens, D White. 1991. Design Report for EMAP, Environmental Monitoring and Assessment Program. USEPA. Corvallis, OR.

Pflieger WL. 1975. The Fishes of Missouri. Missouri Department of Conservation: Columbia, MO. 343 p.

Rankin ET. 1989. The Qualitative Habitat Evaluation Index (QHEI): Rationale, methods and application. Ohio Environmental Protection Agency, Division of Water Quality Planning and Assessments. Columbus, OH.

Rankin ET, CO Yoder. 1990. The Nature of Sampling Variability in the Index of Biotic Integrity (IBI) in Ohio Streams. In: Davis, W.S., ed. Proceedings of the 1990 Midwest pollution control biologists meeting. EPA/905/9-909005. Chicago IL: United States Environmental Protection Agency Region 5, Environmental Sciences Division: 9-18.

Simon TP. 1991. Development of Index of Biotic Integrity expectations for the ecoregions of Indiana. I. Central Corn Belt Plain. U.S. Environmental Protection Agency, Region V, Chicago, IL. EPA 905/9-91/025.

Simon TP. 1992. Biological Criteria Development for Large Rivers with an Emphasis on An Assessment of the White River Drainage, Indiana. U.S. Environmental Protection Agency, Region V, Chicago, IL. EPA 905/R-92/006.

Simon TP. 1998. Development of Index of Biotic Integrity expectations for the ecoregions of Indiana. IV. Eastern Corn Belt Plain. U.S. Environmental Protection Agency, Region V, Chicago, IL. EPA.

Seegert G. 1990. Survey of the Whitewater River and selected tributaries to determine the status of the variegate darter (Etheostoma variatum). 7 p.

Sokal RR, RL Rohlf. 1973. Introduction to biostatistics. Freeman, San Fransisco, CA.

Stahl JR. 1997. Indiana Fish Tissue and Sediment Contaminant Program Monitoring Activities 1997. Indiana Department of Environmental Management, Office of Water Management, Assessment Branch, Biological Studies Section, Indianapolis, IN. IDEM 32/03/011/1997.

Trautman MB. 1981. The Fishes of Ohio. The Ohio State University Press: Columbus, OH. 782 p.

USEPA, Region 5. 1994. Spatial evaluation of the Eastern Corn Belt Plain Rivers and Streams for development of reference condition using EMAP sampling design and indicators, with comparison of results to nonrandom intensive survey design results in Ohio. USEPA, Division of Water. Chicago, IL. QAPjP.

Walterhouse MB. 1993. Fisheries survey of the Whitewater River, 1992. Indiana Department of Natural Resources. Indianapolis. 31 p.

Wisener RJ. 1997. Fisheries Survey of Pipe Creek, 1997. Indiana Department of Natural Resources. Indianapolis. 32 p.

Additional References

Council of Biological Editors, CBE Style Manual Committee. 1994. CBE style manual: a guide for authors, editors, and publishers in the biological sciences. 6th ed. Bethesda (MD): CBE. 825 p.

Hoggat RE. 1975. Drainage Areas of Indiana Streams. U.S. Geological Survey, Indianapolis IN. 231 p.

Omernik JM, AL Gallant. 1988. Ecoregions of the Upper Midwest States. USEPA, ERL, Corvallis, OR. EPA/600/3-88/037

Robins CR, RM Bailey, CE Bond, JR Brooker, EA Lachner, RN Lea, WB Scott. 1991. Common and scientific names of fishes from the United States and Canada. 5th ed. Bethesda (MD): American Fisheries Society Special Publication 20. 181 p.

Appendix A. Location descriptions of sites sampled in the East Fork White River Basin, Indiana, 1997

EVENT ID NUMBER	SITE	LOCATION	COUNTY	LATITUDE			LONGITUDE		
97042	HAW CR	CR 690 N	BARTHOLOMEW	39	18	13.7	85	46	29.3
97048	SF CR	SR 58	BARTHOLOMEW	39	3	37.4	86	2	37.5
97044	NF SALT CR	SALT CR RD	BROWN	39	15	15.4	86	8	17.7
97093	EF WHITE R	CR 900 S	DUBOIS	38	30	40.8	87	0	38.9
97024	WILSON D	CR 200 S	HANCOCK	39	45	41.0	85	49	13.4
97031	W LITTLE SUGAR CR	CR 600 W	HANCOCK	39	43	5.8	85	54	45.3
97004	BIG BLUE R	SR 103	HENRY	39	59	3.9	85	21	6.5
97061	MUTTON CR	CR 700 N	JACKSON	38	58	40.6	85	48	57.7
97068	EF WHITE R	CONF MUSKATUTUCK R	JACKSON	38	46	23.1	86	10	15.8
97057	LITTLE CR	SR 56	JEFFERSON	38	42	46.2	85	32	2.4
97058	HARBERTS CR	CR 350 W	JEFFERSON	38	48	2.7	85	27	16.6
97047	FISH CR	SR 50	JENNINGS	39	3	47.8	85	36	52.1
97074	OTTER CR	SHAPED CHARGE RD (JPG)	JENNINGS	39	2	59.9	85	26	38.7
97002	YOUNGS CR	CR 400 N	JOHNSON	39	32	10.9	86	8	2.1
97053	SALT CR	CR 150 W	LAWRENCE	38	56	14.8	86	30	35.8
97054	EF WHITE R	CR 450 W	LAWRENCE	38	48	31.2	86	32	34.1
97056	L SALT CR	CR 600 E	LAWRENCE	38	58	24.6	86	22	20.2

Appendix A. continued

EVENT ID NUMBER	SITE	LOCATION	COUNTY	LATITUDE			LONGITUDE		
97099	BEAVER CR	SR 50	LAWRENCE	38	43	30.6	86	40	5.0
97094	HAW CR	CR 300 S	MARTIN	38	36	13.5	86	52	19.9
97051	CLEAR CR	DILLMAN RD	MONROE	39	5	35.5	86	52	19.9
97097	SAMS CR	JEEP TRAIL	ORANGE	38	36	57.7	86	40	55.2
97092	EF WHITE R	SR 67	PIKE	38	33	5.0	87	12	2.9
97026	CONNS CR	CR 900 W	RUSH	39	32	13.2	85	36	55.3
97027	GODDARD D	CR 600 W	RUSH	39	35	34.3	85	33	32.7
97062	EF MUSCATUCK R	CR 300 E	SCOTT	38	49	23.7	85	43	27.2
97072	KIMBERLIN CR	CR 350 E	SCOTT	38	39	27.8	85	42	34.2
97001	SUGAR CR	SR 44	SHELBY	39	29	27.9	85	56	57.5
97028	ROBERTS D	CR 400 W	SHELBY	39	28	9.0	85	51	34.1
97029	DRY F	CR 400 N	SHELBY	39	34	56.0	85	54	9.6
97076	FLATROCK R	CR 850 S	SHELBY	39	23	50.8	85	42	39.5
97064	SF LOST R	VERNON SCHOOL RD	WASHINGTON	38	35	27.2	86	15	41.7
97071	DELANEY CR	CR 15	WASHINGTON	38	45	17.1	86	2	48.4

Abbreviation descriptions:

Site:
- CR, Creek
- R, River
- EF, East Fork
- D, Ditch
- SF, South Fork
- TRB, Tributary of
- F, Fork

Location:
- SR, State Road
- CR, County Road
- RD, Road
- W, West
- N, North
- S, South
- E, East
- RR, Railroad
- CONF, Confluence of

Appendix B. Location descriptions of sites sampled in the Whitewater River Basin, Indiana, 1997

EVENT ID NUMBER	SITE	LOCATION	COUNTY	LATITUDE			LONGITUDE		
97014	TRB BUTLER CR	CR 350 E	FAYETTE	39	42	48.9	85	4	27.4
97015	W F WHITEWATER R	BALTIMORE AND OHIO RR	FAYETTE	39	39	8.7	85	7	19.3
97016	WF WHITEWATER R	SR 441	FAYETTE	39	38	11.4	85	7	57.1
97079	SALT CR	BEACON RD	FRANKLIN	39	23	37.9	85	12	40.6
97085	WHITEWATER R	MOUND HAVEN	FRANKLIN	39	22	44.6	84	58	25.8
97088	EF BIG CEDAR CR	REILY PIKE	FRANKLIN	39	26	35.9	84	52	56.0
97089	WHITEWATER R	SR 52	FRANKLIN	39	26	14.7	85	4	24.4
97033	GREENS F	CR 300 E	RANDOLPH	40	2	20.0	84	55	38.1
97017	TRB EF WHITEWATER R	CR 500 W	UNION	39	34	59.3	85	1	47.2
97020	SILVER CR	CR 200 E	UNION	39	41	59.3	84	53	6.9
97021	EF WHITEWATER R	LIBERTY & ABINGTON RD	UNION	39	43	13.0	84	57	59.4
97022	TRB HAROLD CR	SAWMILL RD	UNION	39	38	15.2	84	53	8.1
97023	HANNA CR	CR 300 S	UNION	39	35	24.8	84	56	5.1
97003	NETTLE CR	LEAVELL RD	WAYNE	39	55	22.4	86	10	32.5
97007	GREENS F	E JACKSONBURG RD	WAYNE	39	50	57.8	85	4	43.8
97008	NOLANDS F	SR 38	WAYNE	39	52	57.1	84	58	3.9
97011	WR WHITEWATER R	CONF SYMONS CR	WAYNE	39	48	6.9	85	9	39.9
97034	GREENS F	BOCKHOFFER RD	WAYNE	39	58	42.8	84	58	19.1
97038	WF EF WHITEWATER R	ARBA PIKE	WAYNE	39	56	12.4	84	52	31.4

See Appendix A for abbreviation descriptions

Appendix C Site specific Index of Biotic Integrity and Qualitative Havitat Evaluation Index Scores for the East Fork White River and Whitewater River Basins, 1997

21 January 2000 IDEM 32/03/003/1998

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	330.00
Sub-basin:	DRIFTWOOD	Gradient (ft/mi):	3.62
Stream Name:	SUGAR CR	River Mile:	15.32
Site Location:	SR 44	Electrofishing Gear:	TOTEBARGE
County:	SHELBY	Distance Sampled (m):	330.00
Event ID Number:	97001	Width of Stream (m):	45.80
Date Collected:	07/16/1997	Max depth (m):	7.44

Stream Flow and Hydrolab Data:

Flow (cfs):	85.08	pH (su):	8.01
Dissolved Oxygen (mg/l):	7.44	Turbidity (NTU):	45.80
Specific Conductivity (us/cm):	594.00	Water Temperature (C):	24.41

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	11
Instream Cover:	14	Riffle/Run:	6
Channel Morphology:	16	Gradient:	8
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**77**

Fish Community Score (IBI):

Number of Species:	34.00	5.00
Number of Darter Species:	7.00	5.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	5.00	5.00
Number Sensitive Species:	18.00	5.00
Proportion Tolerant Species:	14.99	5.00
Proportion Omnivores:	8.45	5.00
Proportion Insectivores:	82.29	5.00
Proportion Carnivore:	5.45	3.00
Number of Individuals:	367.00	3.00
Proportion Simple Lithophil:	40.87	3.00
Proportion DELT Anomalies:	0.54	3.00
	Total IBI Score:	**54**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	17.00
Sub-basin	DRIFTWOOD	Gradient (ft/mi):	5.88
Stream Name:	BIG BLUE R	River Mile:	70.00
Site Location:	U/S 300 N	Electrofishing Gear:	BACKPACK
County:	HENRY	Distance Sampled (m):	120.00
Event ID Number:	97004	Width of Steam:	8.20
Date Collected:	07/01/1997	Max depth (m):	1.30

Stream Flow and Hydrolab Data:

Flow (cfs):	17.165	pH (su):	7.54
Dissolved Oxygen (mg/l):	11.73	Turbidity (NTU):	32.20
Specific Conductivity (us/cm):	635.00	Water Temperature (C):	16.94

Habitat Score (QHEI):

Substrate:	10	Pool/Glide:	9
Instream Cover:	10	Riffle/Run:	0
Channel Morphology:	5	Gradient Score:	6
Riparian Zone & Erosion:	5		
		Total QHEI Score:	**45**

Fish Community Score (IBI):

Number of Species:	4.00	1.00
Number Darter/Madtom/Sculpin Species:	1.00	1.00
Proportion Headwater Species:	6.67	1.00
Number Minnow Species:	2.00	1.00
Number Sensitive Species:	0.00	1.00
Proportion Tolerant Species:	93.33	1.00
Proportion Omnivores:	66.67	1.00
Proportion Insectivores:	6.67	1.00
Proportion Pioneer Species:	26.67	1.00
Number of Individuals:	15.00	1.00
Proportion Simple Lithophil:	60.00	1.00
Proportion DELT Anomalies:	0.00	1.00
	Total IBI Score:	**12**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	10.00
Sub-basin	DRIFTWOOD	Gradient (ft/mi):	11.24
Stream Name:	DRY F	River Mile:	0.57
Site Location:	CR 400 N	Electrofishing Gear:	BACKPACK
County:	SHELBY	Distance Sampled (m):	75.00
Event ID Number:	97029	Width of Steam:	4.60
Date Collected:	07/18/1997	Max depth (m):	0.40

Stream Flow and Hydrolab Data:

Flow (cfs):	7.649	pH (su):	8.09
Dissolved Oxygen (mg/l):	12.20	Turbidity (NTU):	8.10
Specific Conductivity (us/cm):	584.00	Water Temperature (C):	26.78

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	5
Instream Cover:	10	Riffle/Run:	3
Channel Morphology:	9	Gradient Score:	8
Riparian Zone & Erosion:	4		
		Total QHEI Score:	**53**

Fish Community Score (IBI):

Number of Species:	13.00	5.00
Number Darter/Madtom/Sculpin Species:	3.00	3.00
Proportion Headwater Species:	2.00	3.00
Number Minnow Species:	6.00	5.00
Number Sensitive Species:	3.00	1.00
Proportion Tolerant Species:	30.00	1.00
Proportion Omnivores:	14.40	5.00
Proportion Insectivores:	21.20	1.00
Proportion Pioneer Species:	95.20	3.00
Number of Individuals:	250.00	5.00
Proportion Simple Lithophil:	4.40	1.00
Proportion DELT Anomalies:	0.80	3.00
	Total IBI Score:	**34**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	5.00
Sub-basin	DRIFTWOOD	Gradient (ft/mi):	5.52
Stream Name:	WILSON D	River Mile:	3.56
Site Location:	CR 200 S	Electrofishing Gear:	BACKPACK
County:	HANCOCK	Distance Sampled (m):	60.00
Event ID Number:	97024	Width of Steam:	4.10
Date Collected:	07/14/1997	Max depth (m):	0.40

Stream Flow and Hydrolab Data:

Flow (cfs):	0.9145	pH (su):	8.28
Dissolved Oxygen (mg/l):	11.35	Turbidity (NTU):	15.00
Specific Conductivity (us/cm):	1,129.00	Water Temperature (C):	23.42

Habitat Score (QHEI):

Substrate:	12	Pool/Glide:	5
Instream Cover:	6	Riffle/Run:	0
Channel Morphology:	12	Gradient Score:	6
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**47**

Fish Community Score (IBI):

Number of Species:	9.00	5.00
Number Darter/Madtom/Sculpin Species:	3.00	1.00
Proportion Headwater Species:	1.27	1.00
Number Minnow Species:	5.00	3.00
Number Sensitive Species:	0.00	3.00
Proportion Tolerant Species:	60.93	1.00
Proportion Omnivores:	30.57	5.00
Proportion Insectivores:	38.00	3.00
Proportion Pioneer Species:	97.88	3.00
Number of Individuals:	471.00	5.00
Proportion Simple Lithophil:	20.17	3.00
Proportion DELT Anomalies:	0.64	3.00
	Total IBI Score:	**34**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	4.00
Sub-basin	DRIFTWOOD	Gradient (ft/mi):	4.72
Stream Name:	YOUNGS CR	River Mile:	2.73
Site Location:	CR 400 N	Electrofishing Gear:	BACKPACK
County:	JOHNSON	Distance Sampled (m):	50.00
Event ID Number:	97002	Width of Steam:	2.20
Date Collected:	07/15/1997	Max depth (m):	0.30

Stream Flow and Hydrolab Data:

Flow (cfs):	0.663	pH (su):	8.26
Dissolved Oxygen (mg/l):	12.80	Turbidity (NTU):	15.00
Specific Conductivity (us/cm):	552.00	Water Temperature (C):	24.72

Habitat Score (QHEI):

Substrate:	12	Pool/Glide:	4
Instream Cover:	6	Riffle/Run:	1
Channel Morphology:	7	Gradient Score:	4
Riparian Zone & Erosion:	5		
		Total QHEI Score:	**39**

Fish Community Score (IBI):

Number of Species:	9.00	3.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	0.00	5.00
Number Minnow Species:	3.00	5.00
Number Sensitive Species:	0.00	5.00
Proportion Tolerant Species:	9.43	1.00
Proportion Omnivores:	1.89	3.00
Proportion Insectivores:	90.57	5.00
Proportion Pioneer Species:	61.32	5.00
Number of Individuals:	106.00	3.00
Proportion Simple Lithophil:	51.89	5.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**40**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	3.00
Sub-basin	DRIFTWOOD	Gradient (ft/mi):	36.76
Stream Name:	W LITTLE SUGAR CR	River Mile:	9.24
Site Location:	CR 600 W	Electrofishing Gear:	BACKPACK
County:	HANCOCK	Distance Sampled (m):	50.00
Event ID Number:	97031	Width of Steam:	2.60
Date Collected:	07/03/1997	Max depth (m):	0.20

Stream Flow and Hydrolab Data:

Flow (cfs):	0.153	pH (su):	7.80
Dissolved Oxygen (mg/l):	8.14	Turbidity (NTU):	39.60
Specific Conductivity (us/cm):	826.00	Water Temperature (C):	21.17

Habitat Score (QHEI):

Substrate:	10	Pool/Glide:	3
Instream Cover:	8	Riffle/Run:	0
Channel Morphology:	8	Gradient Score:	8
Riparian Zone & Erosion:	4		
		Total QHEI Score:	**41**

Fish Community Score (IBI):

Number of Species:	10.00		3.00
Number Darter/Madtom/Sculpin Species:	2.00		1.00
Proportion Headwater Species:	0.00		3.00
Number Minnow Species:	3.00		5.00
Number Sensitive Species:	0.00		5.00
Proportion Tolerant Species:	44.87		1.00
Proportion Omnivores:	14.74		3.00
Proportion Insectivores:	69.23		1.00
Proportion Pioneer Species:	53.21		3.00
Number of Individuals:	156.00		3.00
Proportion Simple Lithophil:	8.97		1.00
Proportion DELT Anomalies:	0.64		3.00
		Total IBI Score:	**34**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	2.50
Sub-basin	DRIFTWOOD	Gradient (ft/mi):	7.75
Stream Name:	ROBERTS D	River Mile:	0.04
Site Location:	CR 400 W	Electrofishing Gear:	BACKPACK
County:	SHELBY	Distance Sampled (m):	50.00
Event ID Number:	97028	Width of Steam:	1.10
Date Collected:	07/15/1997	Max depth (m):	1.10

Stream Flow and Hydrolab Data:

Flow (cfs):	0.131	pH (su):	8.49
Dissolved Oxygen (mg/l):	15.08	Turbidity (NTU):	0.00
Specific Conductivity (us/cm):	471.00	Water Temperature (C):	28.14

Habitat Score (QHEI):

Substrate:	13	Pool/Glide:	10
Instream Cover:	7	Riffle/Run:	3
Channel Morphology:	9	Gradient Score:	6
Riparian Zone & Erosion:	4		
		Total QHEI Score:	**52**

Fish Community Score (IBI):

Number of Species:	12.00	5.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	13.85	3.00
Number Minnow Species:	6.00	5.00
Number Sensitive Species:	0.00	1.00
Proportion Tolerant Species:	40.20	1.00
Proportion Omnivores:	1.01	5.00
Proportion Insectivores:	24.66	3.00
Proportion Pioneer Species:	84.12	5.00
Number of Individuals:	296.00	5.00
Proportion Simple Lithophil:	35.47	3.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**44**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	393.00
Sub-basin:	FLATROCK-HAW	Gradient (ft/mi):	1.98
Stream Name:	FLATROCK R	River Mile:	28.34
Site Location:	CR 850 S	Electrofishing Gear:	BOAT
County:	SHELBY	Distance Sampled (m):	500.00
Event ID Number:	97076	Width of Stream (m):	16.00
Date Collected:	10/02/1997	Max depth (m):	9.40

Stream Flow and Hydrolab Data:

Flow (cfs):	13	pH (su):	8.40
Dissolved Oxygen (mg/l):	9.40	Turbidity (NTU):	16.00
Specific Conductivity (us/cm):	601.00	Water Temperature (C):	15.04

Habitat Score (QHEI):

Substrate:	11	Pool/Glide:	8
Instream Cover:	13	Riffle/Run:	0
Channel Morphology:	12	Gradient:	10
Riparian Zone & Erosion:	5		
		Total QHEI Score:	**59**

Fish Community Score (IBI):

Number of Species:	16.00	3.00
Number of Darter Species:	4.00	3.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	3.00	3.00
Number Sensitive Species:	6.00	3.00
Proportion Tolerant Species:	63.64	1.00
Proportion Omnivores:	58.81	1.00
Proportion Insectivores:	34.38	3.00
Proportion Carnivore:	6.82	3.00
Number of Individuals:	352.00	3.00
Proportion Simple Lithophil:	1.14	3.00
Proportion DELT Anomalies:	0.28	3.00
	Total IBI Score:	**32**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	50.00
Sub-basin:	FLATROCK-HAW	Gradient (ft/mi):	4.70
Stream Name:	CONNS CR	River Mile:	13.03
Site Location:	CR 900 W	Electrofishing Gear:	BACKPACK
County:	RUSH	Distance Sampled (m):	120.00
Event ID Number:	97026	Width of Stream (m):	12.10
Date Collected:	07/17/1997	Max depth (m):	6.97

Stream Flow and Hydrolab Data:

Flow (cfs):	6.417	pH (su):	8.19
Dissolved Oxygen (mg/l):	6.97	Turbidity (NTU):	12.10
Specific Conductivity (us/cm):	583.00	Water Temperature (C):	24.03

Habitat Score (QHEI):

Substrate:	18	Pool/Glide:	8
Instream Cover:	14	Riffle/Run:	5
Channel Morphology:	10	Gradient:	6
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**69**

Fish Community Score (IBI):

Number of Species:	17.00	5.00
Number of Darter Species:	4.00	5.00
Number Sunfish Species:	2.00	3.00
Number Sucker Species:	3.00	3.00
Number Sensitive Species:	6.00	3.00
Proportion Tolerant Species:	21.78	5.00
Proportion Omnivores:	12.87	5.00
Proportion Insectivores:	66.34	5.00
Proportion Carnivore:	9.90	3.00
Number of Individuals:	101.00	1.00
Proportion Simple Lithophil:	16.83	3.00
Proportion DELT Anomalies:	2.97	1.00
	Total IBI Score:	**40**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	17.60
Sub-basin	FLATROCK-HAW	Gradient (ft/mi):	12.58
Stream Name:	HAW CR	River Mile:	13.05
Site Location:	CR 690 N	Electrofishing Gear:	BACKPACK
County:	BARTHOLOMEW	Distance Sampled (m):	105.00
Event ID Number:	97042	Width of Steam:	7.30
Date Collected:	07/21/1997	Max depth (m):	0.40

Stream Flow and Hydrolab Data:

Flow (cfs):	0.297	pH (su):	8.07
Dissolved Oxygen (mg/l):	6.75	Turbidity (NTU):	5.20
Specific Conductivity (us/cm):	571.00	Water Temperature (C):	24.15

Habitat Score (QHEI):

Substrate:	12	Pool/Glide:	5
Instream Cover:	9	Riffle/Run:	0
Channel Morphology:	13	Gradient Score:	10
Riparian Zone & Erosion:	5		
		Total QHEI Score:	**54**

Fish Community Score (IBI):

Number of Species:	11.00	3.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	0.00	3.00
Number Minnow Species:	4.00	5.00
Number Sensitive Species:	2.00	5.00
Proportion Tolerant Species:	42.63	1.00
Proportion Omnivores:	14.21	3.00
Proportion Insectivores:	71.05	1.00
Proportion Pioneer Species:	94.21	5.00
Number of Individuals:	190.00	3.00
Proportion Simple Lithophil:	20.00	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**32**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	5.00
Sub-basin	FLATROCK-HAW	Gradient (ft/mi):	8.00
Stream Name:	GODDARD D	River Mile:	1.82
Site Location:	CR 600 W	Electrofishing Gear:	BACKPACK
County:	RUSH	Distance Sampled (m):	50.00
Event ID Number:	97027	Width of Steam:	2.20
Date Collected:	07/17/1997	Max depth (m):	0.50

Stream Flow and Hydrolab Data:

Flow (cfs):	1.2053	pH (su):	8.12
Dissolved Oxygen (mg/l):	13.28	Turbidity (NTU):	27.30
Specific Conductivity (us/cm):	649.00	Water Temperature (C):	23.99

Habitat Score (QHEI):

Substrate:	13	Pool/Glide:	5
Instream Cover:	12	Riffle/Run:	2
Channel Morphology:	15	Gradient Score:	6
Riparian Zone & Erosion:	2		
		Total QHEI Score:	**55**

Fish Community Score (IBI):

Number of Species:	12.00	5.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	13.37	3.00
Number Minnow Species:	6.00	5.00
Number Sensitive Species:	1.00	3.00
Proportion Tolerant Species:	33.74	1.00
Proportion Omnivores:	10.03	5.00
Proportion Insectivores:	26.44	3.00
Proportion Pioneer Species:	85.11	5.00
Number of Individuals:	329.00	5.00
Proportion Simple Lithophil:	33.13	3.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**42**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	13.50
Sub-basin	UPPER EAST FORK WHITE	Gradient (ft/mi):	11.97
Stream Name:	SF CR	River Mile:	2.69
Site Location:	SR 58	Electrofishing Gear:	BACKPACK
County:	BARTHOLOMEW	Distance Sampled (m):	90.00
Event ID Number:	97048	Width of Steam:	5.80
Date Collected:	08/19/1997	Max depth (m):	1.00

Stream Flow and Hydrolab Data:

Flow (cfs):	10.581	pH (su):	7.40
Dissolved Oxygen (mg/l):	7.90	Turbidity (NTU):	31.80
Specific Conductivity (us/cm):	149.00	Water Temperature (C):	20.50

Habitat Score (QHEI):

Substrate:	6	Pool/Glide:	8
Instream Cover:	8	Riffle/Run:	0
Channel Morphology:	6	Gradient Score:	10
Riparian Zone & Erosion:	3		
		Total QHEI Score:	**41**

Fish Community Score (IBI):

Number of Species:	10.00	1.00
Number Darter/Madtom/Sculpin Species:	0.00	1.00
Proportion Headwater Species:	0.00	3.00
Number Minnow Species:	0.00	5.00
Number Sensitive Species:	1.00	5.00
Proportion Tolerant Species:	46.43	3.00
Proportion Omnivores:	1.79	1.00
Proportion Insectivores:	87.50	1.00
Proportion Pioneer Species:	32.14	1.00
Number of Individuals:	56.00	1.00
Proportion Simple Lithophil:	1.79	1.00
Proportion DELT Anomalies:	12.50	1.00
	Total IBI Score:	**26**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	5.00
Sub-basin	UPPER EAST FORK WHITE	Gradient (ft/mi):	20.00
Stream Name:	FISH CR	River Mile:	2.39
Site Location:	BASE RD	Electrofishing Gear:	BACKPACK
County:	JENNINGS	Distance Sampled (m):	50.00
Event ID Number:	97047	Width of Steam:	3.00
Date Collected:	09/04/1997	Max depth (m):	0.60

Stream Flow and Hydrolab Data:

Flow (cfs):	0.416	pH (su):	8.32
Dissolved Oxygen (mg/l):	10.03	Turbidity (NTU):	4.70
Specific Conductivity (us/cm):	600.00	Water Temperature (C):	17.44

Habitat Score (QHEI):

Substrate:	11	Pool/Glide:	4
Instream Cover:	11	Riffle/Run:	3
Channel Morphology:	8	Gradient Score:	10
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**53**

Fish Community Score (IBI):

Number of Species:	12.00	5.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	0.75	3.00
Number Minnow Species:	7.00	5.00
Number Sensitive Species:	1.00	1.00
Proportion Tolerant Species:	39.85	1.00
Proportion Omnivores:	7.52	3.00
Proportion Insectivores:	61.65	1.00
Proportion Pioneer Species:	60.15	5.00
Number of Individuals:	133.00	3.00
Proportion Simple Lithophil:	6.02	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**34**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	5.00
Sub-basin	UPPER EAST FORK WHITE	Gradient (ft/mi):	20.00
Stream Name:	FISH CR	River Mile:	2.39
Site Location:	BASE RD	Electrofishing Gear:	BACKPACK
County:	JENNINGS	Distance Sampled (m):	50.00
Event ID Number:	97047.5	Width of Steam:	3.00
Date Collected:	10/08/1997	Max depth (m):	0.50

Stream Flow and Hydrolab Data:

Flow (cfs):	N/A	pH (su):	7.94
Dissolved Oxygen (mg/l):	4.87	Turbidity (NTU):	20.70
Specific Conductivity (us/cm):	618.00	Water Temperature (C):	16.85

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	5
Instream Cover:	11	Riffle/Run:	4
Channel Morphology:	13	Gradient Score:	10
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**63**

Fish Community Score (IBI):

Number of Species:	10.00	5.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	0.00	1.00
Number Minnow Species:	5.00	1.00
Number Sensitive Species:	1.00	3.00
Proportion Tolerant Species:	50.96	1.00
Proportion Omnivores:	21.15	3.00
Proportion Insectivores:	37.50	1.00
Proportion Pioneer Species:	72.12	5.00
Number of Individuals:	104.00	3.00
Proportion Simple Lithophil:	1.92	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**28**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	312.00
Sub-basin:	MUSCATATUCK	Gradient (ft/mi):	1.58
Stream Name:	EF MUSCATUCK R	River Mile:	45.18
Site Location:	DOTY MILL RD	Electrofishing Gear:	LONGLINE
County:	SCOTT	Distance Sampled (m):	330.00
Event ID Number:	97062	Width of Stream (m):	21.10
Date Collected:	09/18/1997	Max depth (m):	4.46

Stream Flow and Hydrolab Data:

Flow (cfs):	7.289	pH (su):	7.45
Dissolved Oxygen (mg/l):	4.46	Turbidity (NTU):	21.10
Specific Conductivity (us/cm):	336.00	Water Temperature (C):	20.02

Habitat Score (QHEI):

Substrate:	11	Pool/Glide:	10
Instream Cover:	14	Riffle/Run:	4
Channel Morphology:	16	Gradient:	6
Riparian Zone & Erosion:	5		
		Total QHEI Score:	**66**

Fish Community Score (IBI):

Number of Species:	31.00	5.00
Number of Darter Species:	8.00	5.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	3.00	3.00
Number Sensitive Species:	12.00	5.00
Proportion Tolerant Species:	6.88	5.00
Proportion Omnivores:	3.67	5.00
Proportion Insectivores:	69.72	5.00
Proportion Carnivore:	2.29	1.00
Number of Individuals:	872.00	5.00
Proportion Simple Lithophil:	12.84	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**50**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	57.00
Sub-basin:	MUSCATATUCK	Gradient (ft/mi):	7.04
Stream Name:	OTTER CR	River Mile:	8.30
Site Location:	SHAPED CHARGE RD (JPG)	Electrofishing Gear:	BACKPACK
County:	JENNINGS	Distance Sampled (m):	150.00
Event ID Number:	97074	Width of Stream (m):	0.00
Date Collected:	09/16/1997	Max depth (m):	12.02

Stream Flow and Hydrolab Data:

Flow (cfs):	0.208	pH (su):	8.64
Dissolved Oxygen (mg/l):	12.02	Turbidity (NTU):	0.00
Specific Conductivity (us/cm):	203.00	Water Temperature (C):	24.53

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	8
Instream Cover:	14	Riffle/Run:	6
Channel Morphology:	16	Gradient:	8
Riparian Zone & Erosion:	9		
		Total QHEI Score:	**77**

Fish Community Score (IBI):

Number of Species:	30.00	5.00
Number of Darter Species:	6.00	5.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	5.00	5.00
Number Sensitive Species:	12.00	5.00
Proportion Tolerant Species:	32.72	3.00
Proportion Omnivores:	27.42	3.00
Proportion Insectivores:	57.14	5.00
Proportion Carnivore:	1.38	1.00
Number of Individuals:	434.00	5.00
Proportion Simple Lithophil:	19.82	1.00
Proportion DELT Anomalies:	0.23	5.00
	Total IBI Score:	**46**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	34.00
Sub-basin:	MUSCATATUCK	Gradient (ft/mi):	4.90
Stream Name:	DELANEY CR	River Mile:	1.02
Site Location:	MT. EDNA RD	Electrofishing Gear:	BACKPACK
County:	WASHINGTON	Distance Sampled (m):	120.00
Event ID Number:	97071	Width of Stream (m):	163.00
Date Collected:	09/10/1997	Max depth (m):	6.10

Stream Flow and Hydrolab Data:

Flow (cfs):	5.135	pH (su):	7.51
Dissolved Oxygen (mg/l):	6.10	Turbidity (NTU):	163.00
Specific Conductivity (us/cm):	174.00	Water Temperature (C):	20.50

Habitat Score (QHEI):

Substrate:	7	Pool/Glide:	8
Instream Cover:	8	Riffle/Run:	5
Channel Morphology:	16	Gradient:	6
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**58**

Fish Community Score (IBI):

Number of Species:	18.00	5.00
Number of Darter Species:	3.00	5.00
Number Sunfish Species:	3.00	3.00
Number Sucker Species:	2.00	3.00
Number Sensitive Species:	4.00	3.00
Proportion Tolerant Species:	9.43	5.00
Proportion Omnivores:	5.66	5.00
Proportion Insectivores:	86.79	5.00
Proportion Carnivore:	5.66	3.00
Number of Individuals:	53.00	1.00
Proportion Simple Lithophil:	35.85	3.00
Proportion DELT Anomalies:	0.00	1.00
	Total IBI Score:	**46**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	34.00
Sub-basin:	MUSCATATUCK	Gradient (ft/mi):	4.90
Stream Name:	DELANEY CR	River Mile:	1.02
Site Location:	MT. EDNA RD	Electrofishing Gear:	BACKPACK
County:	WASHINGTON	Distance Sampled (m):	120.00
Event ID Number:	97071.5	Width of Stream (m):	46.00
Date Collected:	10/07/1997	Max depth (m):	5.02

Stream Flow and Hydrolab Data:

Flow (cfs):	N/A	pH (su):	7.60
Dissolved Oxygen (mg/l):	5.02	Turbidity (NTU):	46.00
Specific Conductivity (us/cm):	213.00	Water Temperature (C):	17.19

Habitat Score (QHEI):

Substrate:	6	Pool/Glide:	7
Instream Cover:	6	Riffle/Run:	3
Channel Morphology:	12	Gradient:	6
Riparian Zone & Erosion:	7		
		Total QHEI Score:	**47**

Fish Community Score (IBI):

Number of Species:	24.00	5.00
Number of Darter Species:	6.00	5.00
Number Sunfish Species:	2.00	3.00
Number Sucker Species:	3.00	3.00
Number Sensitive Species:	5.00	3.00
Proportion Tolerant Species:	14.77	5.00
Proportion Omnivores:	11.81	5.00
Proportion Insectivores:	78.48	5.00
Proportion Carnivore:	2.11	1.00
Number of Individuals:	237.00	3.00
Proportion Simple Lithophil:	19.83	1.00
Proportion DELT Anomalies:	0.00	3.00
	Total IBI Score:	**44**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	20.00
Sub-basin	MUSCATATUCK	Gradient (ft/mi):	5.62
Stream Name:	KIMBERLIN CR	River Mile:	3.37
Site Location:	RONNIE AVE	Electrofishing Gear:	BACKPACK
County:	SCOTT	Distance Sampled (m):	105.00
Event ID Number:	97072	Width of Steam:	7.20
Date Collected:	09/11/1997	Max depth (m):	0.50

Stream Flow and Hydrolab Data:

Flow (cfs):	3.368	pH (su):	7.65
Dissolved Oxygen (mg/l):	7.31	Turbidity (NTU):	120.00
Specific Conductivity (us/cm):	194.00	Water Temperature (C):	19.53

Habitat Score (QHEI):

Substrate:	10	Pool/Glide:	6
Instream Cover:	8	Riffle/Run:	1
Channel Morphology:	13	Gradient Score:	6
Riparian Zone & Erosion:	5		
		Total QHEI Score:	**49**

Fish Community Score (IBI):

Number of Species:	10.00		1.00
Number Darter/Madtom/Sculpin Species:	1.00		3.00
Proportion Headwater Species:	0.00		5.00
Number Minnow Species:	2.00		5.00
Number Sensitive Species:	3.00		5.00
Proportion Tolerant Species:	12.73		5.00
Proportion Omnivores:	0.00		1.00
Proportion Insectivores:	87.27		1.00
Proportion Pioneer Species:	9.09		1.00
Number of Individuals:	55.00		1.00
Proportion Simple Lithophil:	5.45		1.00
Proportion DELT Anomalies:	1.82		1.00
		Total IBI Score:	**32**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	17.00
Sub-basin	MUSCATATUCK	Gradient (ft/mi):	5.08
Stream Name:	MUTTON CR	River Mile:	6.17
Site Location:	CR 700 N	Electrofishing Gear:	BACKPACK
County:	JACKSON	Distance Sampled (m):	60.00
Event ID Number:	97061	Width of Steam:	3.80
Date Collected:	09/25/1997	Max depth (m):	0.25

Stream Flow and Hydrolab Data:

Flow (cfs):	0.271	pH (su):	8.19
Dissolved Oxygen (mg/l):	9.01	Turbidity (NTU):	15.60
Specific Conductivity (us/cm):	461.00	Water Temperature (C):	13.19

Habitat Score (QHEI):

Substrate:	12	Pool/Glide:	4
Instream Cover:	6	Riffle/Run:	1
Channel Morphology:	16	Gradient Score:	6
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**53**

Fish Community Score (IBI):

Number of Species:	9.00	3.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	0.00	5.00
Number Minnow Species:	4.00	5.00
Number Sensitive Species:	1.00	5.00
Proportion Tolerant Species:	16.44	1.00
Proportion Omnivores:	11.64	3.00
Proportion Insectivores:	84.25	1.00
Proportion Pioneer Species:	81.51	5.00
Number of Individuals:	146.00	3.00
Proportion Simple Lithophil:	6.16	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**34**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	8.50
Sub-basin	MUSCATATUCK	Gradient (ft/mi):	16.48
Stream Name:	LITTLE CR	River Mile:	9.39
Site Location:	SR 56	Electrofishing Gear:	BACKPACK
County:	JEFFERSON	Distance Sampled (m):	75.00
Event ID Number:	97057	Width of Steam:	5.30
Date Collected:	09/15/1997	Max depth (m):	0.30

Stream Flow and Hydrolab Data:

Flow (cfs):	0.333	pH (su):	8.34
Dissolved Oxygen (mg/l):	12.50	Turbidity (NTU):	1.90
Specific Conductivity (us/cm):	462.00	Water Temperature (C):	23.97

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	3
Instream Cover:	11	Riffle/Run:	3
Channel Morphology:	17	Gradient Score:	10
Riparian Zone & Erosion:	3		
		Total QHEI Score:	**61**

Fish Community Score (IBI):

Number of Species:	11.00	1.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	9.46	3.00
Number Minnow Species:	2.00	5.00
Number Sensitive Species:	2.00	5.00
Proportion Tolerant Species:	30.41	5.00
Proportion Omnivores:	5.41	3.00
Proportion Insectivores:	76.35	1.00
Proportion Pioneer Species:	23.65	1.00
Number of Individuals:	148.00	3.00
Proportion Simple Lithophil:	8.11	1.00
Proportion DELT Anomalies:	1.35	1.00
	Total IBI Score:	**32**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	7.00
Sub-basin	MUSCATATUCK	Gradient (ft/mi):	21.43
Stream Name:	HARBERTS CR	River Mile:	6.10
Site Location:	CR 350 W	Electrofishing Gear:	BACKPACK
County:	JEFFERSON	Distance Sampled (m):	105.00
Event ID Number:	97058	Width of Steam:	7.30
Date Collected:	09/16/1997	Max depth (m):	0.20

Stream Flow and Hydrolab Data:

Flow (cfs):	0.146	pH (su):	7.57
Dissolved Oxygen (mg/l):	3.27	Turbidity (NTU):	2.90
Specific Conductivity (us/cm):	380.00	Water Temperature (C):	18.60

Habitat Score (QHEI):

Substrate:	10	Pool/Glide:	3
Instream Cover:	4	Riffle/Run:	0
Channel Morphology:	13	Gradient Score:	8
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**44**

Fish Community Score (IBI):

Number of Species:	11.00		5.00
Number Darter/Madtom/Sculpin Species:	2.00		1.00
Proportion Headwater Species:	14.64		1.00
Number Minnow Species:	6.00		3.00
Number Sensitive Species:	0.00		1.00
Proportion Tolerant Species:	61.57		1.00
Proportion Omnivores:	41.44		5.00
Proportion Insectivores:	24.31		1.00
Proportion Pioneer Species:	84.97		3.00
Number of Individuals:	765.00		5.00
Proportion Simple Lithophil:	13.59		1.00
Proportion DELT Anomalies:	0.26		3.00
		Total IBI Score:	**30**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	7.00
Sub-basin	MUSCATATUCK	Gradient (ft/mi):	21.43
Stream Name:	HARBERTS CR	River Mile:	6.10
Site Location:	CR 350 W	Electrofishing Gear:	BACKPACK
County:	JEFFERSON	Distance Sampled (m):	105.00
Event ID Number:	97058.5	Width of Steam:	7.30
Date Collected:	10/07/1997	Max depth (m):	0.10

Stream Flow and Hydrolab Data:

Flow (cfs):	N/A	pH (su):	8.44
Dissolved Oxygen (mg/l):	8.27	Turbidity (NTU):	22.10
Specific Conductivity (us/cm):	369.00	Water Temperature (C):	19.07

Habitat Score (QHEI):

Substrate:	10	Pool/Glide:	4
Instream Cover:	2	Riffle/Run:	0
Channel Morphology:	13	Gradient Score:	8
Riparian Zone & Erosion:	4		
		Total QHEI Score:	**41**

Fish Community Score (IBI):

Number of Species:	9.00		3.00
Number Darter/Madtom/Sculpin Species:	3.00		1.00
Proportion Headwater Species:	13.32		1.00
Number Minnow Species:	5.00		3.00
Number Sensitive Species:	1.00		1.00
Proportion Tolerant Species:	59.05		1.00
Proportion Omnivores:	42.64		5.00
Proportion Insectivores:	21.88		1.00
Proportion Pioneer Species:	85.83		3.00
Number of Individuals:	713.00		5.00
Proportion Simple Lithophil:	6.73		1.00
Proportion DELT Anomalies:	0.70		3.00
		Total IBI Score:	**28**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	5,726.00
Sub-basin:	LOWER EAST FORK WHITE	Gradient (ft/mi):	0.55
Stream Name:	EF WHITE R	River Mile:	2.84
Site Location:	SR 57	Electrofishing Gear:	BOAT
County:	PIKE	Distance Sampled (m):	500.00
Event ID Number:	97092	Width of Stream (m):	134.00
Date Collected:	08/26/1997	Max depth (m):	7.41

Stream Flow and Hydrolab Data:

Flow (cfs):	3.37	pH (su):	8.19
Dissolved Oxygen (mg/l):	7.41	Turbidity (NTU):	134.00
Specific Conductivity (us/cm):	349.00	Water Temperature (C):	22.84

Habitat Score (QHEI):

Substrate:	13	Pool/Glide:	11
Instream Cover:	11	Riffle/Run:	0
Channel Morphology:	14	Gradient:	8
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**63**

Fish Community Score (IBI):

Number of Species:	17.00	5.00
Number of Darter Species:	0.00	1.00
Number Sunfish Species:	3.00	1.00
Number Sucker Species:	1.00	5.00
Number Sensitive Species:	3.00	1.00
Proportion Tolerant Species:	7.98	1.00
Proportion Omnivores:	49.77	5.00
Proportion Insectivores:	38.50	3.00
Proportion Carnivore:	10.80	5.00
Number of Individuals:	213.00	1.00
Proportion Simple Lithophil:	42.72	5.00
Proportion DELT Anomalies:	1.41	1.00
	Total IBI Score:	**36**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	5,623.00
Sub-basin:	LOWER EAST FORK WHITE	Gradient (ft/mi):	0.55
Stream Name:	EF WHITE R	River Mile:	19.58
Site Location:	CR 500 W	Electrofishing Gear:	BOAT
County:	DUBOIS	Distance Sampled (m):	500.00
Event ID Number:	97093	Width of Stream (m):	130.00
Date Collected:	08/27/1997	Max depth (m):	7.98

Stream Flow and Hydrolab Data:

Flow (cfs):	3.18	pH (su):	8.28
Dissolved Oxygen (mg/l):	7.98	Turbidity (NTU):	130.00
Specific Conductivity (us/cm):	354.00	Water Temperature (C):	23.86

Habitat Score (QHEI):

Substrate:	8	Pool/Glide:	11
Instream Cover:	9	Riffle/Run:	0
Channel Morphology:	11	Gradient:	8
Riparian Zone & Erosion:	7		
		Total QHEI Score:	**54**

Fish Community Score (IBI):

Number of Species:	17.00	3.00
Number of Darter Species:	1.00	1.00
Number Sunfish Species:	1.00	1.00
Number Sucker Species:	2.00	3.00
Number Sensitive Species:	1.00	1.00
Proportion Tolerant Species:	16.80	3.00
Proportion Omnivores:	45.73	5.00
Proportion Insectivores:	43.80	5.00
Proportion Carnivore:	8.82	3.00
Number of Individuals:	363.00	1.00
Proportion Simple Lithophil:	29.20	3.00
Proportion DELT Anomalies:	1.38	1.00
	Total IBI Score:	**34**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	4,688.00
Sub-basin:	LOWER EAST FORK WHITE	Gradient (ft/mi):	0.81
Stream Name:	EF WHITE R	River Mile:	139.26
Site Location:	CR 450 W	Electrofishing Gear:	BOAT
County:	LAWRENCE	Distance Sampled (m):	500.00
Event ID Number:	97054	Width of Stream (m):	39.00
Date Collected:	09/23/1997	Max depth (m):	8.64

Stream Flow and Hydrolab Data:

Flow (cfs):		pH (su):	8.08
Dissolved Oxygen (mg/l):	8.64	Turbidity (NTU):	39.00
Specific Conductivity (us/cm):	530.00	Water Temperature (C):	19.65

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	11
Instream Cover:	13	Riffle/Run:	0
Channel Morphology:	11	Gradient:	8
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**67**

Fish Community Score (IBI):

Number of Species:	20.00	5.00
Number of Darter Species:	1.00	1.00
Number Sunfish Species:	6.00	3.00
Number Sucker Species:	3.00	5.00
Number Sensitive Species:	4.00	5.00
Proportion Tolerant Species:	6.40	5.00
Proportion Omnivores:	11.82	5.00
Proportion Insectivores:	69.46	3.00
Proportion Carnivore:	16.75	1.00
Number of Individuals:	203.00	3.00
Proportion Simple Lithophil:	0.99	1.00
Proportion DELT Anomalies:	0.49	3.00
	Total IBI Score:	**42**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	3,717.00
Sub-basin:	LOWER EAST FORK WHITE	Gradient (ft/mi):	1.47
Stream Name:	EF WHITE R	River Mile:	178.98
Site Location:	CONF MUSKATUTUCK R	Electrofishing Gear:	BOAT
County:	JACKSON	Distance Sampled (m):	500.00
Event ID Number:	97068	Width of Stream (m):	30.60
Date Collected:	09/24/1997	Max depth (m):	9.04

Stream Flow and Hydrolab Data:

Flow (cfs):	N/A	pH (su):	8.32
Dissolved Oxygen (mg/l):	9.04	Turbidity (NTU):	30.60
Specific Conductivity (us/cm):	621.00	Water Temperature (C):	17.66

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	11
Instream Cover:	14	Riffle/Run:	0
Channel Morphology:	11	Gradient:	10
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**70**

Fish Community Score (IBI):

Number of Species:	28.00	5.00
Number of Darter Species:	6.00	1.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	3.00	5.00
Number Sensitive Species:	8.00	3.00
Proportion Tolerant Species:	11.73	5.00
Proportion Omnivores:	15.08	5.00
Proportion Insectivores:	65.92	3.00
Proportion Carnivore:	13.41	3.00
Number of Individuals:	179.00	3.00
Proportion Simple Lithophil:	12.85	3.00
Proportion DELT Anomalies:	0.56	3.00
	Total IBI Score:	**46**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	573.00
Sub-basin:	LOWER EAST FORK WHITE	Gradient (ft/mi):	0.62
Stream Name:	SALT CR	River Mile:	18.29
Site Location:	CR 150 W	Electrofishing Gear:	SCANOE
County:	LAWRENCE	Distance Sampled (m):	240.00
Event ID Number:	97053	Width of Stream (m):	15.40
Date Collected:	09/23/1997	Max depth (m):	6.14

Stream Flow and Hydrolab Data:

Flow (cfs):	4.29	pH (su):	7.56
Dissolved Oxygen (mg/l):	6.14	Turbidity (NTU):	15.40
Specific Conductivity (us/cm):	276.00	Water Temperature (C):	18.17

Habitat Score (QHEI):

Substrate:	9	Pool/Glide:	9
Instream Cover:	17	Riffle/Run:	0
Channel Morphology:	11	Gradient:	4
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**58**

Fish Community Score (IBI):

Number of Species:	13.00	1.00
Number of Darter Species:	3.00	3.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	1.00	1.00
Number Sensitive Species:	5.00	3.00
Proportion Tolerant Species:	8.33	5.00
Proportion Omnivores:	5.00	5.00
Proportion Insectivores:	80.00	5.00
Proportion Carnivore:	13.33	5.00
Number of Individuals:	60.00	1.00
Proportion Simple Lithophil:	20.00	5.00
Proportion DELT Anomalies:	0.00	1.00
	Total IBI Score:	**40**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	32.00
Sub-basin:	LOWER EAST FORK WHITE	Gradient (ft/mi):	14.29
Stream Name:	NF SALT CR	River Mile:	43.30
Site Location:	SALT CR RD	Electrofishing Gear:	BACKPACK
County:	BROWN	Distance Sampled (m):	150.00
Event ID Number:	97044	Width of Stream (m):	26.50
Date Collected:	07/28/1997	Max depth (m):	9.66

Stream Flow and Hydrolab Data:

Flow (cfs):	2.054	pH (su):	8.24
Dissolved Oxygen (mg/l):	9.66	Turbidity (NTU):	26.50
Specific Conductivity (us/cm):	186.00	Water Temperature (C):	27.77

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	6
Instream Cover:	12	Riffle/Run:	3
Channel Morphology:	12	Gradient:	8
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**61**

Fish Community Score (IBI):

Number of Species:	17.00	5.00
Number of Darter Species:	3.00	5.00
Number Sunfish Species:	3.00	3.00
Number Sucker Species:	2.00	3.00
Number Sensitive Species:	7.00	5.00
Proportion Tolerant Species:	12.88	5.00
Proportion Omnivores:	6.13	5.00
Proportion Insectivores:	79.14	5.00
Proportion Carnivore:	4.29	1.00
Number of Individuals:	163.00	3.00
Proportion Simple Lithophil:	19.63	1.00
Proportion DELT Anomalies:	0.00	3.00
	Total IBI Score:	**46**

Site Information:

Basin:	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	25.50
Sub-basin:	LOWER EAST FORK WHITE	Gradient (ft/mi):	10.36
Stream Name:	CLEAR CR	River Mile:	13.40
Site Location:	DILLMAN RD	Electrofishing Gear:	BACKPACK
County:	MONROE	Distance Sampled (m):	150.00
Event ID Number:	97051	Width of Stream (m):	6.90
Date Collected:	08/04/1997	Max depth (m):	7.58

Stream Flow and Hydrolab Data:

Flow (cfs):	6.251	pH (su):	7.28
Dissolved Oxygen (mg/l):	7.58	Turbidity (NTU):	6.90
Specific Conductivity (us/cm):	509.00	Water Temperature (C):	26.75

Habitat Score (QHEI):

Substrate:	17	Pool/Glide:	11
Instream Cover:	14	Riffle/Run:	7
Channel Morphology:	16	Gradient:	10
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**83**

Fish Community Score (IBI):

Number of Species:	18.00	5.00
Number of Darter Species:	5.00	5.00
Number Sunfish Species:	3.00	3.00
Number Sucker Species:	2.00	3.00
Number Sensitive Species:	5.00	3.00
Proportion Tolerant Species:	18.14	5.00
Proportion Omnivores:	2.95	5.00
Proportion Insectivores:	33.33	3.00
Proportion Carnivore:	5.91	3.00
Number of Individuals:	237.00	3.00
Proportion Simple Lithophil:	8.86	3.00
Proportion DELT Anomalies:	0.00	3.00
	Total IBI Score:	**44**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	17.00
Sub-basin	LOWER EAST FORK WHITE	Gradient (ft/mi):	11.76
Stream Name:	BEAVER CR	River Mile:	17.04
Site Location:	SR 50	Electrofishing Gear:	LONGLINE
County:	LAWRENCE	Distance Sampled (m):	105.00
Event ID Number:	97099	Width of Steam:	7.00
Date Collected:	09/08/1997	Max depth (m):	1.20

Stream Flow and Hydrolab Data:

Flow (cfs):	5.346	pH (su):	7.23
Dissolved Oxygen (mg/l):	0.78	Turbidity (NTU):	15.90
Specific Conductivity (us/cm):	377.00	Water Temperature (C):	22.57

Habitat Score (QHEI):

Substrate:	1	Pool/Glide:	8
Instream Cover:	18	Riffle/Run:	0
Channel Morphology:	8	Gradient Score:	10
Riparian Zone & Erosion:	9		
		Total QHEI Score:	**54**

Fish Community Score (IBI):

Number of Species:	8.00	1.00
Number Darter/Madtom/Sculpin Species:	1.00	1.00
Proportion Headwater Species:	0.00	5.00
Number Minnow Species:	1.00	3.00
Number Sensitive Species:	0.00	3.00
Proportion Tolerant Species:	2.94	1.00
Proportion Omnivores:	2.94	1.00
Proportion Insectivores:	58.82	1.00
Proportion Pioneer Species:	0.00	1.00
Number of Individuals:	34.00	1.00
Proportion Simple Lithophil:	0.00	1.00
Proportion DELT Anomalies:	0.00	1.00
	Total IBI Score:	**22**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	16.30
Sub-basin	LOWER EAST FORK WHITE	Gradient (ft/mi):	28.30
Stream Name:	LITTLE SALT CR	River Mile:	11.74
Site Location:	CR 600 E	Electrofishing Gear:	BACKPACK
County:	LAWRENCE	Distance Sampled (m):	180.00
Event ID Number:	97056	Width of Steam:	12.20
Date Collected:	09/05/1997	Max depth (m):	1.10

Stream Flow and Hydrolab Data:

Flow (cfs):	1.4	pH (su):	7.41
Dissolved Oxygen (mg/l):	10.42	Turbidity (NTU):	35.00
Specific Conductivity (us/cm):	278.00	Water Temperature (C):	19.69

Habitat Score (QHEI):

Substrate:	10	Pool/Glide:	9
Instream Cover:	8	Riffle/Run:	0
Channel Morphology:	14	Gradient Score:	6
Riparian Zone & Erosion:	5		
		Total QHEI Score:	**52**

Fish Community Score (IBI):

Number of Species:	11.00	1.00
Number Darter/Madtom/Sculpin Species:	2.00	5.00
Proportion Headwater Species:	19.70	5.00
Number Minnow Species:	3.00	5.00
Number Sensitive Species:	6.00	5.00
Proportion Tolerant Species:	12.12	3.00
Proportion Omnivores:	9.09	1.00
Proportion Insectivores:	68.18	1.00
Proportion Pioneer Species:	27.27	5.00
Number of Individuals:	66.00	1.00
Proportion Simple Lithophil:	13.64	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**38**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	13.00
Sub-basin	LOWER EAST FORK WHITE	Gradient (ft/mi):	12.05
Stream Name:	HAW CR	River Mile:	1.93
Site Location:	CR 300 S	Electrofishing Gear:	BACKPACK
County:	MARTIN	Distance Sampled (m):	105.00
Event ID Number:	97094	Width of Steam:	7.00
Date Collected:	08/28/1997	Max depth (m):	1.00

Stream Flow and Hydrolab Data:

Flow (cfs):	1.727	pH (su):	7.79
Dissolved Oxygen (mg/l):	3.57	Turbidity (NTU):	11.00
Specific Conductivity (us/cm):	828.00	Water Temperature (C):	23.16

Habitat Score (QHEI):

Substrate:	5	Pool/Glide:	9
Instream Cover:	13	Riffle/Run:	0
Channel Morphology:	11	Gradient Score:	10
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**54**

Fish Community Score (IBI):

Number of Species:	12.00	3.00
Number Darter/Madtom/Sculpin Species:	1.00	1.00
Proportion Headwater Species:	0.00	3.00
Number Minnow Species:	3.00	5.00
Number Sensitive Species:	1.00	5.00
Proportion Tolerant Species:	28.87	3.00
Proportion Omnivores:	3.09	1.00
Proportion Insectivores:	86.60	1.00
Proportion Pioneer Species:	27.84	3.00
Number of Individuals:	97.00	1.00
Proportion Simple Lithophil:	0.00	1.00
Proportion DELT Anomalies:	1.03	3.00
	Total IBI Score:	**30**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	6.00
Sub-basin	LOWER EAST FORK WHITE	Gradient (ft/mi):	21.16
Stream Name:	SF LOST R	River Mile:	4.81
Site Location:	MT. TABOR RD	Electrofishing Gear:	BACKPACK
County:	WASHINGTON	Distance Sampled (m):	75.00
Event ID Number:	97064	Width of Steam:	4.80
Date Collected:	09/09/1997	Max depth (m):	0.60

Stream Flow and Hydrolab Data:

Flow (cfs):	0.73	pH (su):	7.83
Dissolved Oxygen (mg/l):	6.44	Turbidity (NTU):	23.40
Specific Conductivity (us/cm):	420.00	Water Temperature (C):	19.57

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	6
Instream Cover:	18	Riffle/Run:	3
Channel Morphology:	16	Gradient Score:	8
Riparian Zone & Erosion:	7		
		Total QHEI Score:	**72**

Fish Community Score (IBI):

Number of Species:	9.00	3.00
Number Darter/Madtom/Sculpin Species:	1.00	5.00
Proportion Headwater Species:	0.00	3.00
Number Minnow Species:	4.00	5.00
Number Sensitive Species:	4.00	5.00
Proportion Tolerant Species:	31.71	3.00
Proportion Omnivores:	0.00	1.00
Proportion Insectivores:	53.66	1.00
Proportion Pioneer Species:	41.46	1.00
Number of Individuals:	41.00	1.00
Proportion Simple Lithophil:	17.07	1.00
Proportion DELT Anomalies:	0.00	1.00
	Total IBI Score:	**32**

Site Information:

Basin	EAST FORK WHITE RIVER BASIN	Drainage Area (sq mi):	4.50
Sub-basin	LOWER EAST FORK WHITE	Gradient (ft/mi):	15.50
Stream Name:	SAMS CR	River Mile:	1.78
Site Location:	JEEP TRAIL	Electrofishing Gear:	LONGLINE
County:	ORANGE	Distance Sampled (m):	75.00
Event ID Number:	97097	Width of Steam:	4.80
Date Collected:	09/09/1997	Max depth (m):	1.00

Stream Flow and Hydrolab Data:

Flow (cfs):	2.382	pH (su):	7.39
Dissolved Oxygen (mg/l):	2.80	Turbidity (NTU):	2.54
Specific Conductivity (us/cm):	227.00	Water Temperature (C):	20.64

Habitat Score (QHEI):

Substrate:	5	Pool/Glide:	8
Instream Cover:	17	Riffle/Run:	0
Channel Morphology:	11	Gradient Score:	10
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**59**

Fish Community Score (IBI):

Number of Species:	15.00	3.00
Number Darter/Madtom/Sculpin Species:	1.00	3.00
Proportion Headwater Species:	0.60	3.00
Number Minnow Species:	4.00	5.00
Number Sensitive Species:	2.00	5.00
Proportion Tolerant Species:	32.14	3.00
Proportion Omnivores:	2.38	3.00
Proportion Insectivores:	94.05	1.00
Proportion Pioneer Species:	27.98	3.00
Number of Individuals:	168.00	3.00
Proportion Simple Lithophil:	4.17	1.00
Proportion DELT Anomalies:	1.19	3.00
	Total IBI Score:	**36**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	1,272.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	5.83
Stream Name:	WHITEWATER R	River Mile:	24.88
Site Location:	MOUND HAVEN	Electrofishing Gear:	SCANOE
County:	FRANKLIN	Distance Sampled (m):	500.00
Event ID Number:	97085	Width of Stream (m):	13.30
Date Collected:	07/23/1997	Max depth (m):	8.27

Stream Flow and Hydrolab Data:

Flow (cfs):	1072	pH (su):	8.22
Dissolved Oxygen (mg/l):	8.27	Turbidity (NTU):	13.30
Specific Conductivity (us/cm):	577.00	Water Temperature (C):	23.22

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	10
Instream Cover:	11	Riffle/Run:	6
Channel Morphology:	12	Gradient:	10
Riparian Zone & Erosion:	7		
		Total QHEI Score:	**70**

Fish Community Score (IBI):

Number of Species:	15.00	3.00
Number of Darter Species:	2.00	1.00
Number Sunfish Species:	2.00	3.00
Number Sucker Species:	2.00	3.00
Number Sensitive Species:	7.00	3.00
Proportion Tolerant Species:	27.36	3.00
Proportion Omnivores:	27.36	5.00
Proportion Insectivores:	60.38	1.00
Proportion Carnivore:	7.55	1.00
Number of Individuals:	106.00	5.00
Proportion Simple Lithophil:	9.43	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**32**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	824.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	4.47
Stream Name:	WHITEWATER R	River Mile:	35.36
Site Location:	SR 52	Electrofishing Gear:	SCANOE
County:	FRANKLIN	Distance Sampled (m):	450.00
Event ID Number:	97089	Width of Stream (m):	781.00
Date Collected:	09/30/1997	Max depth (m):	11.51

Stream Flow and Hydrolab Data:

Flow (cfs):	133.873	pH (su):	8.60
Dissolved Oxygen (mg/l):	11.51	Turbidity (NTU):	781.00
Specific Conductivity (us/cm):	607.00	Water Temperature (C):	18.32

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	12
Instream Cover:	13	Riffle/Run:	4
Channel Morphology:	16	Gradient:	10
Riparian Zone & Erosion:	10		
		Total QHEI Score:	**81**

Fish Community Score (IBI):

Number of Species:	29.00	5.00
Number of Darter Species:	5.00	5.00
Number Sunfish Species:	3.00	3.00
Number Sucker Species:	5.00	5.00
Number Sensitive Species:	11.00	5.00
Proportion Tolerant Species:	15.49	5.00
Proportion Omnivores:	9.86	5.00
Proportion Insectivores:	73.94	5.00
Proportion Carnivore:	7.04	3.00
Number of Individuals:	142.00	1.00
Proportion Simple Lithophil:	26.06	3.00
Proportion DELT Anomalies:	0.00	1.00
	Total IBI Score:	**50**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	440.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	6.36
Stream Name:	WF WHITEWATER R	River Mile:	59.90
Site Location:	SR 44/1	Electrofishing Gear:	TOTEBARGE
County:	FAYETTE	Distance Sampled (m):	500.00
Event ID Number:	97016	Width of Stream (m):	52.40
Date Collected:	07/30/1997	Max depth (m):	8.42

Stream Flow and Hydrolab Data:

Flow (cfs):	59.408	pH (su):	8.11
Dissolved Oxygen (mg/l):	8.42	Turbidity (NTU):	52.40
Specific Conductivity (us/cm):	622.00	Water Temperature (C):	19.58

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	9
Instream Cover:	9	Riffle/Run:	3
Channel Morphology:	10	Gradient:	10
Riparian Zone & Erosion:	4		
		Total QHEI Score:	**59**

Fish Community Score (IBI):

Number of Species:	27.00	5.00
Number of Darter Species:	4.00	3.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	4.00	5.00
Number Sensitive Species:	11.00	5.00
Proportion Tolerant Species:	27.94	3.00
Proportion Omnivores:	21.47	5.00
Proportion Insectivores:	52.06	5.00
Proportion Carnivore:	7.06	3.00
Number of Individuals:	340.00	3.00
Proportion Simple Lithophil:	24.41	3.00
Proportion DELT Anomalies:	0.88	3.00
	Total IBI Score:	**48**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	434.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	7.07
Stream Name:	WF WHITEWATER R	River Mile:	61.26
Site Location:	BALTIMORE AND OHIO RR	Electrofishing Gear:	TOTEBARGE
County:	FAYETTE	Distance Sampled (m):	225.00
Event ID Number:	97015	Width of Stream (m):	15.50
Date Collected:	07/29/1997	Max depth (m):	11.25

Stream Flow and Hydrolab Data:

Flow (cfs):	65.98	pH (su):	8.40
Dissolved Oxygen (mg/l):	11.25	Turbidity (NTU):	15.50
Specific Conductivity (us/cm):	585.00	Water Temperature (C):	23.96

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	9
Instream Cover:	13	Riffle/Run:	7
Channel Morphology:	17	Gradient:	10
Riparian Zone & Erosion:	7		
		Total QHEI Score:	**79**

Fish Community Score (IBI):

Number of Species:	18.00	3.00
Number of Darter Species:	3.00	3.00
Number Sunfish Species:	2.00	3.00
Number Sucker Species:	3.00	3.00
Number Sensitive Species:	9.00	5.00
Proportion Tolerant Species:	18.87	5.00
Proportion Omnivores:	13.21	5.00
Proportion Insectivores:	68.55	5.00
Proportion Carnivore:	7.55	3.00
Number of Individuals:	159.00	1.00
Proportion Simple Lithophil:	51.57	3.00
Proportion DELT Anomalies:	1.26	1.00
	Total IBI Score:	**44**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	200.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	6.29
Stream Name:	EF WHITEWATER R	River Mile:	25.75
Site Location:	RIVER RD	Electrofishing Gear:	SCANOE
County:	UNION	Distance Sampled (m):	225.00
Event ID Number:	97021	Width of Stream (m):	6.10
Date Collected:	10/01/1997	Max depth (m):	8.55

Stream Flow and Hydrolab Data:

Flow (cfs):	267.9	pH (su):	8.21
Dissolved Oxygen (mg/l):	8.55	Turbidity (NTU):	6.10
Specific Conductivity (us/cm):	885.00	Water Temperature (C):	14.45

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	11
Instream Cover:	13	Riffle/Run:	6
Channel Morphology:	13	Gradient:	10
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**75**

Fish Community Score (IBI):

Number of Species:	26.00	5.00
Number of Darter Species:	5.00	5.00
Number Sunfish Species:	5.00	5.00
Number Sucker Species:	4.00	5.00
Number Sensitive Species:	12.00	5.00
Proportion Tolerant Species:	14.60	5.00
Proportion Omnivores:	10.84	5.00
Proportion Insectivores:	67.04	5.00
Proportion Carnivore:	3.32	1.00
Number of Individuals:	452.00	5.00
Proportion Simple Lithophil:	55.09	1.00
Proportion DELT Anomalies:	0.88	5.00
	Total IBI Score:	**54**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	95.20
Sub-basin:	WHITEWATER	Gradient (ft/mi):	7.35
Stream Name:	WF WHITEWATER R	River Mile:	75.68
Site Location:	CONF SYMONS CR	Electrofishing Gear:	BACKPACK
County:	WAYNE	Distance Sampled (m):	255.00
Event ID Number:	97011	Width of Stream (m):	73.50
Date Collected:	07/22/1997	Max depth (m):	10.24

Stream Flow and Hydrolab Data:

Flow (cfs):	17.733	pH (su):	8.33
Dissolved Oxygen (mg/l):	10.24	Turbidity (NTU):	73.50
Specific Conductivity (us/cm):	672.00	Water Temperature (C):	19.86

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	7
Instream Cover:	12	Riffle/Run:	5
Channel Morphology:	18	Gradient:	10
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**74**

Fish Community Score (IBI):

Number of Species:	17.00	3.00
Number of Darter Species:	3.00	3.00
Number Sunfish Species:	3.00	3.00
Number Sucker Species:	2.00	3.00
Number Sensitive Species:	7.00	3.00
Proportion Tolerant Species:	27.94	3.00
Proportion Omnivores:	3.68	5.00
Proportion Insectivores:	65.44	5.00
Proportion Carnivore:	0.74	1.00
Number of Individuals:	136.00	1.00
Proportion Simple Lithophil:	23.53	1.00
Proportion DELT Anomalies:	1.47	1.00
	Total IBI Score:	**34**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	73.50
Sub-basin:	WHITEWATER	Gradient (ft/mi):	11.49
Stream Name:	GREENS F	River Mile:	8.99
Site Location:	KEPLER RD	Electrofishing Gear:	TOTEBARGE
County:	WAYNE	Distance Sampled (m):	225.00
Event ID Number:	97007	Width of Stream (m):	10.30
Date Collected:	07/08/1997	Max depth (m):	9.90

Stream Flow and Hydrolab Data:

Flow (cfs):	37.173	pH (su):	8.05
Dissolved Oxygen (mg/l):	9.90	Turbidity (NTU):	10.30
Specific Conductivity (us/cm):	625.00	Water Temperature (C):	20.93

Habitat Score (QHEI):

Substrate:	15	Pool/Glide:	12
Instream Cover:	13	Riffle/Run:	3
Channel Morphology:	13	Gradient:	8
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**70**

Fish Community Score (IBI):

Number of Species:	23.00	5.00
Number of Darter Species:	3.00	3.00
Number Sunfish Species:	3.00	3.00
Number Sucker Species:	4.00	5.00
Number Sensitive Species:	11.00	5.00
Proportion Tolerant Species:	18.81	5.00
Proportion Omnivores:	5.80	5.00
Proportion Insectivores:	43.73	3.00
Proportion Carnivore:	6.58	3.00
Number of Individuals:	638.00	5.00
Proportion Simple Lithophil:	18.97	3.00
Proportion DELT Anomalies:	1.10	5.00
	Total IBI Score:	**46**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	57.60
Sub-basin:	WHITEWATER	Gradient (ft/mi):	14.29
Stream Name:	SALT CR	River Mile:	6.55
Site Location:	BEACON RD	Electrofishing Gear:	BACKPACK
County:	FRANKLIN	Distance Sampled (m):	135.00
Event ID Number:	97079	Width of Stream (m):	51.90
Date Collected:	09/29/1997	Max depth (m):	8.83

Stream Flow and Hydrolab Data:

Flow (cfs):	0.88	pH (su):	8.16
Dissolved Oxygen (mg/l):	8.83	Turbidity (NTU):	51.90
Specific Conductivity (us/cm):	455.00	Water Temperature (C):	18.94

Habitat Score (QHEI):

Substrate:	18	Pool/Glide:	6
Instream Cover:	17	Riffle/Run:	4
Channel Morphology:	17	Gradient:	10
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**80**

Fish Community Score (IBI):

Number of Species:	21.00	5.00
Number of Darter Species:	6.00	5.00
Number Sunfish Species:	3.00	3.00
Number Sucker Species:	0.00	1.00
Number Sensitive Species:	10.00	5.00
Proportion Tolerant Species:	8.16	5.00
Proportion Omnivores:	3.27	5.00
Proportion Insectivores:	82.45	5.00
Proportion Carnivore:	11.84	5.00
Number of Individuals:	245.00	3.00
Proportion Simple Lithophil:	16.73	5.00
Proportion DELT Anomalies:	0.00	3.00
	Total IBI Score:	**48**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	39.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	9.62
Stream Name:	GREENS F	River Mile:	21.64
Site Location:	BOCKHOFFER RD	Electrofishing Gear:	BACKPACK
County:	WAYNE	Distance Sampled (m):	105.00
Event ID Number:	97034	Width of Stream (m):	63.70
Date Collected:	07/02/1997	Max depth (m):	8.33

Stream Flow and Hydrolab Data:

Flow (cfs):	16.509	pH (su):	7.62
Dissolved Oxygen (mg/l):	8.33	Turbidity (NTU):	63.70
Specific Conductivity (us/cm):	573.00	Water Temperature (C):	22.33

Habitat Score (QHEI):

Substrate:	17	Pool/Glide:	12
Instream Cover:	14	Riffle/Run:	6
Channel Morphology:	15	Gradient:	10
Riparian Zone & Erosion:	9		
		Total QHEI Score:	**83**

Fish Community Score (IBI):

Number of Species:	18.00	5.00
Number of Darter Species:	4.00	5.00
Number Sunfish Species:	2.00	3.00
Number Sucker Species:	3.00	3.00
Number Sensitive Species:	8.00	5.00
Proportion Tolerant Species:	18.58	5.00
Proportion Omnivores:	6.19	5.00
Proportion Insectivores:	65.49	5.00
Proportion Carnivore:	3.98	1.00
Number of Individuals:	226.00	3.00
Proportion Simple Lithophil:	24.34	1.00
Proportion DELT Anomalies:	1.33	3.00
	Total IBI Score:	**46**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	28.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	8.81
Stream Name:	NOLANDS F	River Mile:	19.15
Site Location:	SR 38	Electrofishing Gear:	BACKPACK
County:	WAYNE	Distance Sampled (m):	180.00
Event ID Number:	97008	Width of Stream (m):	26.20
Date Collected:	07/08/1997	Max depth (m):	7.93

Stream Flow and Hydrolab Data:

Flow (cfs):	19.123	pH (su):	8.06
Dissolved Oxygen (mg/l):	7.93	Turbidity (NTU):	26.20
Specific Conductivity (us/cm):	616.00	Water Temperature (C):	19.32

Habitat Score (QHEI):

Substrate:	15	Pool/Glide:	7
Instream Cover:	12	Riffle/Run:	4
Channel Morphology:	11	Gradient:	10
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**65**

Fish Community Score (IBI):

Number of Species:	23.00	5.00
Number of Darter Species:	3.00	5.00
Number Sunfish Species:	4.00	5.00
Number Sucker Species:	4.00	5.00
Number Sensitive Species:	9.00	5.00
Proportion Tolerant Species:	35.88	3.00
Proportion Omnivores:	23.48	5.00
Proportion Insectivores:	54.62	5.00
Proportion Carnivore:	7.92	3.00
Number of Individuals:	379.00	5.00
Proportion Simple Lithophil:	42.48	3.00
Proportion DELT Anomalies:	0.79	5.00
	Total IBI Score:	**54**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	21.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	22.22
Stream Name:	HANNA CR	River Mile:	3.52
Site Location:	CR 300 S	Electrofishing Gear:	BACKPACK
County:	UNION	Distance Sampled (m):	120.00
Event ID Number:	97023	Width of Stream (m):	0.00
Date Collected:	07/30/1997	Max depth (m):	9.75

Stream Flow and Hydrolab Data:

Flow (cfs):	20.409	pH (su):	8.53
Dissolved Oxygen (mg/l):	9.75	Turbidity (NTU):	0.00
Specific Conductivity (us/cm):	535.00	Water Temperature (C):	25.08

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	7
Instream Cover:	13	Riffle/Run:	6
Channel Morphology:	17	Gradient:	8
Riparian Zone & Erosion:	9		
		Total QHEI Score:	**76**

Fish Community Score (IBI):

Number of Species:	18.00	5.00
Number of Darter Species:	2.00	3.00
Number Sunfish Species:	2.00	3.00
Number Sucker Species:	2.00	3.00
Number Sensitive Species:	4.00	3.00
Proportion Tolerant Species:	28.62	3.00
Proportion Omnivores:	5.31	5.00
Proportion Insectivores:	40.35	3.00
Proportion Carnivore:	0.16	1.00
Number of Individuals:	622.00	5.00
Proportion Simple Lithophil:	16.40	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**40**

Site Information:

Basin:	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	21.00
Sub-basin:	WHITEWATER	Gradient (ft/mi):	22.22
Stream Name:	HANNA CR	River Mile:	3.52
Site Location:	CR 300 S	Electrofishing Gear:	BACKPACK
County:	UNION	Distance Sampled (m):	120.00
Event ID Number:	97023.5	Width of Stream (m):	4.60
Date Collected:	10/09/1997	Max depth (m):	6.69

Stream Flow and Hydrolab Data:

Flow (cfs):	N/A	pH (su):	8.32
Dissolved Oxygen (mg/l):	6.69	Turbidity (NTU):	4.60
Specific Conductivity (us/cm):	576.00	Water Temperature (C):	18.02

Habitat Score (QHEI):

Substrate:	12	Pool/Glide:	6
Instream Cover:	8	Riffle/Run:	2
Channel Morphology:	15	Gradient:	10
Riparian Zone & Erosion:	10		
		Total QHEI Score:	**63**

Fish Community Score (IBI):

Number of Species:	17.00	5.00
Number of Darter Species:	3.00	5.00
Number Sunfish Species:	1.00	1.00
Number Sucker Species:	3.00	3.00
Number Sensitive Species:	4.00	3.00
Proportion Tolerant Species:	39.61	3.00
Proportion Omnivores:	20.78	5.00
Proportion Insectivores:	35.34	3.00
Proportion Carnivore:	1.17	1.00
Number of Individuals:	515.00	5.00
Proportion Simple Lithophil:	16.12	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**40**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	17.70
Sub-basin	WHITEWATER	Gradient (ft/mi):	16.00
Stream Name:	NETTLE CR	River Mile:	2.76
Site Location:	LEAVELL RD	Electrofishing Gear:	BACKPACK
County:	WAYNE	Distance Sampled (m):	120.00
Event ID Number:	97003	Width of Steam:	7.80
Date Collected:	07/07/1997	Max depth (m):	0.80

Stream Flow and Hydrolab Data:

Flow (cfs):	15.983	pH (su):	8.01
Dissolved Oxygen (mg/l):	9.45	Turbidity (NTU):	11.40
Specific Conductivity (us/cm):	652.00	Water Temperature (C):	19.18

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	9
Instream Cover:	12	Riffle/Run:	5
Channel Morphology:	15	Gradient Score:	10
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**71**

Fish Community Score (IBI):

Number of Species:	11.00	3.00
Number Darter/Madtom/Sculpin Species:	3.00	1.00
Proportion Headwater Species:	57.78	1.00
Number Minnow Species:	6.00	5.00
Number Sensitive Species:	0.00	1.00
Proportion Tolerant Species:	72.07	3.00
Proportion Omnivores:	11.73	5.00
Proportion Insectivores:	14.93	5.00
Proportion Pioneer Species:	29.64	3.00
Number of Individuals:	469.00	5.00
Proportion Simple Lithophil:	59.06	5.00
Proportion DELT Anomalies:	0.21	3.00
	Total IBI Score:	**38**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	9.20
Sub-basin	WHITEWATER	Gradient (ft/mi):	12.05
Stream Name:	GREENS F	River Mile:	27.59
Site Location:	CR 900 S	Electrofishing Gear:	BACKPACK
County:	RANDOLPH	Distance Sampled (m):	60.00
Event ID Number:	97033	Width of Steam:	3.50
Date Collected:	07/02/1997	Max depth (m):	0.70

Stream Flow and Hydrolab Data:

Flow (cfs):	1.721	pH (su):	7.62
Dissolved Oxygen (mg/l):	7.76	Turbidity (NTU):	44.60
Specific Conductivity (us/cm):	599.00	Water Temperature (C):	21.32

Habitat Score (QHEI):

Substrate:	14	Pool/Glide:	7
Instream Cover:	12	Riffle/Run:	5
Channel Morphology:	16	Gradient Score:	8
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**68**

Fish Community Score (IBI):

Number of Species:	7.00	3.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	52.83	5.00
Number Minnow Species:	3.00	5.00
Number Sensitive Species:	1.00	5.00
Proportion Tolerant Species:	18.87	3.00
Proportion Omnivores:	0.00	1.00
Proportion Insectivores:	77.36	3.00
Proportion Pioneer Species:	37.74	1.00
Number of Individuals:	53.00	1.00
Proportion Simple Lithophil:	30.19	3.00
Proportion DELT Anomalies:	1.89	1.00
	Total IBI Score:	**38**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	5.00
Sub-basin	WHITEWATER	Gradient (ft/mi):	32.00
Stream Name:	SILVER CR	River Mile:	11.17
Site Location:	CR 200 E	Electrofishing Gear:	BACKPACK
County:	UNION	Distance Sampled (m):	75.00
Event ID Number:	97020	Width of Steam:	4.80
Date Collected:	07/10/1997	Max depth (m):	0.95

Stream Flow and Hydrolab Data:

Flow (cfs):	2.83	pH (su):	8.24
Dissolved Oxygen (mg/l):	8.86	Turbidity (NTU):	23.80
Specific Conductivity (us/cm):	651.00	Water Temperature (C):	15.85

Habitat Score (QHEI):

Substrate:	17	Pool/Glide:	9
Instream Cover:	11	Riffle/Run:	4
Channel Morphology:	19	Gradient Score:	6
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**74**

Fish Community Score (IBI):

Number of Species:	11.00	5.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	42.20	1.00
Number Minnow Species:	7.00	5.00
Number Sensitive Species:	0.00	1.00
Proportion Tolerant Species:	60.69	1.00
Proportion Omnivores:	6.94	3.00
Proportion Insectivores:	24.28	5.00
Proportion Pioneer Species:	56.07	5.00
Number of Individuals:	173.00	3.00
Proportion Simple Lithophil:	47.40	5.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**38**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	5.00
Sub-basin	WHITEWATER	Gradient (ft/mi):	31.00
Stream Name:	EF BIG CEDAR CR	River Mile:	2.31
Site Location:	REILY PIKE	Electrofishing Gear:	BACKPACK
County:	FRANKLIN	Distance Sampled (m):	60.00
Event ID Number:	97088	Width of Steam:	3.70
Date Collected:	07/23/1997	Max depth (m):	0.20

Stream Flow and Hydrolab Data:

Flow (cfs):	0.085	pH (su):	8.48
Dissolved Oxygen (mg/l):	8.63	Turbidity (NTU):	34.40
Specific Conductivity (us/cm):	527.00	Water Temperature (C):	25.26

Habitat Score (QHEI):

Substrate:	12	Pool/Glide:	0
Instream Cover:	7	Riffle/Run:	4
Channel Morphology:	14	Gradient Score:	8
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**53**

Fish Community Score (IBI):

Number of Species:	6.00	3.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	16.97	1.00
Number Minnow Species:	4.00	5.00
Number Sensitive Species:	0.00	1.00
Proportion Tolerant Species:	71.46	1.00
Proportion Omnivores:	4.19	5.00
Proportion Insectivores:	5.79	3.00
Proportion Pioneer Species:	83.03	5.00
Number of Individuals:	501.00	5.00
Proportion Simple Lithophil:	22.55	3.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**32**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	2.50
Sub-basin	WHITEWATER	Gradient (ft/mi):	30.61
Stream Name:	WF EF WHITEWATER R	River Mile:	8.52
Site Location:	ARBA PIKE	Electrofishing Gear:	BACKPACK
County:	WAYNE	Distance Sampled (m):	50.00
Event ID Number:	97038	Width of Steam:	1.90
Date Collected:	07/01/1997	Max depth (m):	0.50

Stream Flow and Hydrolab Data:

Flow (cfs):	0.526	pH (su):	7.97
Dissolved Oxygen (mg/l):	8.30	Turbidity (NTU):	0.00
Specific Conductivity (us/cm):	571.00	Water Temperature (C):	24.22

Habitat Score (QHEI):

Substrate:	15	Pool/Glide:	5
Instream Cover:	12	Riffle/Run:	3
Channel Morphology:	13	Gradient Score:	8
Riparian Zone & Erosion:	7		
		Total QHEI Score:	**63**

Fish Community Score (IBI):

Number of Species:	6.00	5.00
Number Darter/Madtom/Sculpin Species:	2.00	1.00
Proportion Headwater Species:	57.94	3.00
Number Minnow Species:	4.00	1.00
Number Sensitive Species:	0.00	3.00
Proportion Tolerant Species:	48.60	3.00
Proportion Omnivores:	6.54	3.00
Proportion Insectivores:	26.17	5.00
Proportion Pioneer Species:	42.06	5.00
Number of Individuals:	107.00	3.00
Proportion Simple Lithophil:	42.99	5.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**42**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	3.00
Sub-basin	WHITEWATER	Gradient (ft/mi):	33.33
Stream Name:	TRB BUTLER CR	River Mile:	0.64
Site Location:	CR 350 E	Electrofishing Gear:	BACKPACK
County:	FAYETTE	Distance Sampled (m):	50.00
Event ID Number:	97014	Width of Steam:	2.90
Date Collected:	07/09/1997	Max depth (m):	0.40

Stream Flow and Hydrolab Data:

Flow (cfs):	1.275	pH (su):	8.20
Dissolved Oxygen (mg/l):	8.63	Turbidity (NTU):	10.60
Specific Conductivity (us/cm):	624.00	Water Temperature (C):	19.56

Habitat Score (QHEI):

Substrate:	17	Pool/Glide:	6
Instream Cover:	13	Riffle/Run:	3
Channel Morphology:	16	Gradient Score:	8
Riparian Zone & Erosion:	6		
		Total QHEI Score:	**69**

Fish Community Score (IBI):

Number of Species:	11.00	5.00
Number Darter/Madtom/Sculpin Species:	4.00	1.00
Proportion Headwater Species:	49.14	3.00
Number Minnow Species:	7.00	5.00
Number Sensitive Species:	0.00	1.00
Proportion Tolerant Species:	44.88	3.00
Proportion Omnivores:	5.98	5.00
Proportion Insectivores:	16.46	5.00
Proportion Pioneer Species:	49.71	5.00
Number of Individuals:	869.00	5.00
Proportion Simple Lithophil:	48.56	5.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**48**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	2.00
Sub-basin	WHITEWATER	Gradient (ft/mi):	54.94
Stream Name:	TRB EF WHITEWATER R	River Mile:	1.63
Site Location:	CR 500 W	Electrofishing Gear:	BACKPACK
County:	UNION	Distance Sampled (m):	50.00
Event ID Number:	97017	Width of Steam:	1.90
Date Collected:	07/24/1997	Max depth (m):	0.60

Stream Flow and Hydrolab Data:

Flow (cfs):	0.238	pH (su):	8.17
Dissolved Oxygen (mg/l):	8.58	Turbidity (NTU):	56.80
Specific Conductivity (us/cm):	607.00	Water Temperature (C):	16.68

Habitat Score (QHEI):

Substrate:	17	Pool/Glide:	6
Instream Cover:	11	Riffle/Run:	4
Channel Morphology:	17	Gradient Score:	4
Riparian Zone & Erosion:	8		
		Total QHEI Score:	**67**

Fish Community Score (IBI):

Number of Species:	6.00	5.00
Number Darter/Madtom/Sculpin Species:	2.00	3.00
Proportion Headwater Species:	76.70	1.00
Number Minnow Species:	4.00	5.00
Number Sensitive Species:	2.00	1.00
Proportion Tolerant Species:	84.30	5.00
Proportion Omnivores:	0.00	5.00
Proportion Insectivores:	14.80	1.00
Proportion Pioneer Species:	9.90	5.00
Number of Individuals:	223.00	5.00
Proportion Simple Lithophil:	9.01	1.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**44**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	2.00
Sub-basin	WHITEWATER	Gradient (ft/mi):	54.94
Stream Name:	TRB EF WHITEWATER R	River Mile:	1.63
Site Location:	CR 500 W	Electrofishing Gear:	BACKPACK
County:	UNION	Distance Sampled (m):	50.00
Event ID Number:	97017.5	Width of Steam:	1.90
Date Collected:	10/08/1997	Max depth (m):	0.60

Stream Flow and Hydrolab Data:

Flow (cfs):	N/A	pH (su):	8.73
Dissolved Oxygen (mg/l):	12.12	Turbidity (NTU):	3.40
Specific Conductivity (us/cm):	617.00	Water Temperature (C):	16.80

Habitat Score (QHEI):

Substrate:	16	Pool/Glide:	4
Instream Cover:	12	Riffle/Run:	3
Channel Morphology:	16	Gradient Score:	4
Riparian Zone & Erosion:	10		
		Total QHEI Score:	**65**

Fish Community Score (IBI):

Number of Species:	5.00	5.00
Number Darter/Madtom/Sculpin Species:	1.00	1.00
Proportion Headwater Species:	92.01	1.00
Number Minnow Species:	4.00	5.00
Number Sensitive Species:	1.00	1.00
Proportion Tolerant Species:	96.45	5.00
Proportion Omnivores:	0.00	5.00
Proportion Insectivores:	1.48	5.00
Proportion Pioneer Species:	6.80	5.00
Number of Individuals:	338.00	5.00
Proportion Simple Lithophil:	93.20	5.00
Proportion DELT Anomalies:	0.00	5.00
	Total IBI Score:	**44**

Site Information:

Basin	WHITEWATER RIVER BASIN	Drainage Area (sq mi):	0.50
Sub-basin	WHITEWATER	Gradient (ft/mi):	107.14
Stream Name:	TRB HAROLD CR	River Mile:	0.23
Site Location:	GREENWOOD CHURCH RD	Electrofishing Gear:	BACKPACK
County:	UNION	Distance Sampled (m):	50.00
Event ID Number:	97022	Width of Steam:	1.50
Date Collected:	07/10/1997	Max depth (m):	0.30

Stream Flow and Hydrolab Data:

Flow (cfs):	N/A	pH (su):	8.06
Dissolved Oxygen (mg/l):	6.42	Turbidity (NTU):	25.10
Specific Conductivity (us/cm):	670.00	Water Temperature (C):	20.45

Habitat Score (QHEI):

Substrate:	15	Pool/Glide:	4
Instream Cover:	10	Riffle/Run:	0
Channel Morphology:	16	Gradient Score:	4
Riparian Zone & Erosion:	10		
		Total QHEI Score:	**59**

Fish Community Score (IBI):

Number of Species:	2.00	5.00
Number Darter/Madtom/Sculpin Species:	0.00	1.00
Proportion Headwater Species:	57.89	1.00
Number Minnow Species:	2.00	1.00
Number Sensitive Species:	0.00	1.00
Proportion Tolerant Species:	100.00	1.00
Proportion Omnivores:	0.00	1.00
Proportion Insectivores:	0.00	1.00
Proportion Pioneer Species:	42.11	1.00
Number of Individuals:	19.00	1.00
Proportion Simple Lithophil:	57.89	1.00
Proportion DELT Anomalies:	0.00	1.00
	Total IBI Score:	**20**